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Coordination of Clinical Teaching: The Method and Results of an Experiment*

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That medical colleges are overdepartmentalized may be a debatable subject. Certainly, there is not uniformity of opinion regarding the number of departments required. The number of preclinical departments is fairly well agreed on, but in the clinical phase, variations appear. One or more of the following are departments in some schools and not in others,—orthopedics, urology, gynecology, proctology and neurosurgery. There does not appear to be any uniformity of opinion for dividing a school into a large number of departments. That a particular subject may be taught by one who has had the more intensive training and experience is the more common explanation. It is not my purpose to enter on the discussion of the pros and cons of this subject, but to enumerate certain of the difficulties which have arisen from such a system and to present the experiment of coordination of clinical teaching which has been carried out at the University of Iowa for the past four years.

Under the usual departmental system, each department is assigned a given number of hours to teach its particular subject. There is much overlapping of subjects from one department to another. The instructors are not familiar with the extent to which a given subject is presented by another department and in many instances they are not certain that it is presented at all by another department. In most instances, therefore, where subjects overlap, they are approached by each department as though they had not been discussed before or neglected entirely. A great deal of the allotted time is taken up by unnecessary duplication. Numerous illustrations are available. The contagious diseases are frequently presented by the pediatric, medical and public health departments. In most instances, each presents the etiology, pathology, epidemiology, subjective and objective manifestations, differential diagnosis, complications and treatment. Comparable presentations are made by two or more departments of diseases of the thyroid, the biliary tract, stomach, lungs and kidneys, just to mention a few.

It is because of these unnecessary duplications that Dean MacEwen, at the

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University of Iowa, appointed a committee of six to study this problem. The Committee was composed of Dr. A. L. Sahs of neurology, Dr. J. Wm. Dulin of surgery, Dr. E. D. Warner of pathology, Dr. J. D. Boyd of pediatrics, Dr. W. F. Mengert of obstetrics and gynecology, and Dr. James A. Greene of medicine. The committee recommended to the faculty that the clinical subjects be coordinated and presented in sequence by the various departments. It was agreed that any and all differences of opinion should be presented, that certain fundamental subjects be taught before any coordination be begun, and that initially it be restricted to the didactic phase of the clinical subjects, except for pathology. The preclinical curriculum was not altered except that the pathology of organs or systems was included in the coordinated course. The clinical subjects which were considered to be fundamental before coordination was begun were infant feeding and nutrition, physical diagnosis, laboratory diagnosis, normal obstetrics and the principles of surgery. The time formerly used by the pathology department to present organ or systemic pathology during the second year was additional time for the presentation of the above clinical subjects. The coordinated presentation of the clinical subjects was begun during the third trimester of the sophomore year and continued throughout the junior year.

Before coordination could be instituted it was necessary to review the subjects taught by each clinical department and to divide the material into that which could and that which could not be coordinated. This was accomplished by conferences between members of the committee and members of the different departments. That which was considered suitable for coordination was scheduled so that it was presented in logical sequence with that presented by other departments. That which was not suitable for coordination was scheduled at another time. The entire courses of medicine, surgery and gynecology were incorporated into this coordination and parts of obstetrics, pediatrics, neurology, psychiatry, ophthalmology, otolaryngology, dermatology, radiology, orthopedics and public health. In addition, members of the anatomy, physiology, pharmacology, bacteriology and biochemistry departments were asked to join in the discussion of certain subjects.

Initially each department was allotted the same number of hours which they had used previously and the time permitted for each subject was the same as they had used the previous year. I had been advised that it was easier to obtain permission to amputate a healthy leg than to obtain permission to reduce a lecturer's time by as much as thirty minutes. The possibility of reduction of time allotted to a department was of some concern to most of the members of the different departments during the initial discussion. When it became apparent that no alteration of time was permitted, this concern immediately disappeared. Numerous schedules of coordination were drawn up before the first effective one was adopted. Each schedule was discussed with the head or members of each participating department. In this fashion it was a composite picture of the opinions of the entire group and not that of one man or small group of men. The members of each participating department felt, therefore, a definite responsibility for the coordination.

The revised schedule was instituted in the Fall of 1940 with the sophomore class, and the coordination began with the Spring trimester with that class. It was necessary to schedule the pathology laboratory on certain days and, therefore, the sequence of the discussion was not always perfect. As a rule, however, the pathologic description was presented first, followed by presentation of the pathologic physiology, subjective and objective manifestations, differential diagnosis, diagnosis and treatment by a member of the departments concerned pri-

TABLE 1.

Monday,	July 20—8:00 A. M.	Diseases of the Esophagus	Dr. Smith
	8:25 A. M.	Diseases of the Esophagus	Dr. Gillies
	9:00 A. M.	Diseases of the Esophagus	Dr. Lierle
Tuesday,	July 21—8:00 A. M.	Diseases of the Esophagus	Dr. Peterson
	9:00 A. M.	Pathology of the G. I. Tract	Pathology
Wednesday,	July 22—8:00 A. M.	Peptic Ulcer	Dr. Smith
	9:00 A. M.	Gastroscopy	Dr. Paul
Thursday,	July 23—8:00 A. M.	Peptic Ulcer	Dr. Smith
	9:00 A. M.	Carcinoma of the Stomach	Dr. Paul
Friday,	July 24—8:00 A. M.	Peptic Ulcer	Dr. Peterson
	9:00 A. M.	Diets in Diseases of the Stomach	Dr. Daum

Shows part of the schedule for presentation of diseases of the gastroenteric tract.

marily with that particular disease or syndrome. The personnel of other departments then presented the subject from their particular angle until the subject was discussed thoroughly. Each department was permitted to present the subject from its particular angle. A part of the schedule is shown in table 1.

The subjects first presented were those affecting the entire body (Table 2). The order of presentation were nutritional diseases, metabolic diseases, endocrine diseases, allergic diseases, systemic infections, diseases of the heart, of the blood vessels, of the kidneys, of the female generative tract, of the respiratory tract,

TABLE 2.

Wednesday,	December 16—8:00 A. M.	Endocrines	Dr. Plass
	9:00 A. M.	Infantilism	Drs. Flocks, Greene and Plass
Thursday,	December 17—8:00 A. M.	Endocrines	Dr. Plass
	9:00 A. M.	Endocrines	Pathology
Friday,	December 18—8:00 A. M.	Symposium: Endocrines in Adolescence	Drs. Boyd, Flocks, Greene and Plass
Saturday,	December 19—8:00 A. M.	Examination on Metabolism and Endocrines	Proctored by Dr. Greene
Wednesday,	January 6—8:00 A. M.	Typhoid Fever	Dr. DeGowin
	9:00 A. M.	Typhoid Fever	Dr. Barnes
Thursday,	January 7—8:00 A. M.	Undulant Fever	Dr. Korns
	9:00 A. M.	Pathology of Infectious Diseases	
Friday,	January 8—8:00 A. M.	Undulant Fever	Dr. Borts
	9:00 A. M.	Undulant Fever	Dr. O'Brien
	9:15 A. M.	Undulant Fever	Dr. Thornton
Saturday,	January 9—8:00 A. M.	Tularemia	Drs. Borts, DeGowin and O'Brien
	9:00 A. M.	Tetanus	Dr. Peterson

Shows part of the schedule for third trimester of sophomore year.

of the blood, lymph glands, from poisons, of the bones and joints and of the nervous system. A definite problem arose in regards to the schedule. The surgeons usually approach a problem from the angle of regions, the internists from the standpoint of systems or diseases. A compromise plan was worked out and appeared to be satisfactory. The surgeons were willing to discuss diseases of the thyroid under the general term of diseases of the endocrine glands instead of

under diseases of the neck. When we came to the diseases of the gastroenteric tract, it was necessary for the surgeons to have presented the subject of diseases of the abdominal wall before they could logically discuss diseases of the contents of the abdomen. By scheduling the discussion of diseases of the abdominal wall just before that of the gastroenteric tract the continuity of the discussion was not interrupted.

Roundtable discussions were instituted for certain subjects, (Table 2, Friday, December 18, and Table 3). During these discussions members of several departments sat in a semicircle in front of the students, one of them acted as the leader and guided the trend of thought, keeping the discussors to the subject at

TABLE 3.

Tuesday,	January 5—8 A. M.	Injuries to the Brain	Dr. Sahs
Friday,	January 8—8 A. M.	Injuries to the Brain	Dr. Miller
Saturday,	January 9—9 A. M.	Injuries to the Brain	Dr. Hyndman (2 hrs.)
Tuesday,	January 12—8 A. M.	Symposium on Vertigo	Drs. Sahs, Korns, Lierle & Miller
Friday,	January 15—8 A. M.	Symposium on Fits, Falls, Faints	Drs. Boyd, Hyndman, Miller, Paul and Sahs

Shows other parts of schedule.

hand, received questions written by the students and read them at appropriate times. The discussors presented the subject in an informal fashion, each was free to question any statement by the other and to present the particular aspect as related to the field of endeavor in which he was working. In instances these discussions became intense, but never did they become undignified or were personalities involved. The student received, therefore, the divergent opinions of those concerned and the facts and opinions on which all were agreed. The student was permitted to write questions and hand them to the leader of the discussion. The question could be directed to the group or to any one of the group. As the question became appropriate, it was asked by the leader and those questions which did not become appropriate during the discussion were answered during a ten minute period allowed at the end of the period.

At first, only a few subjects were presented under this plan, but as time went by more and more subjects appeared to be appropriate for this method of presentation. The common cold was one of the first presented in this fashion. The departments represented were bacteriology, public health, otolaryngology, pediatrics, pathology and medicine. The bacteriologist presented the etiology in response to a question from the leader. Other members were free to ask questions, to disagree, or to make additions. At first, it was difficult to know how much time to allocate for each phase of a given subject, but with some experience the leader was soon able to see that the subject was covered and that sufficient time was left for arguments and differences of opinion.

At approximately a given time, the leader deftly, rarely bluntly, directed the discussion to the epidemiology and prevention of spread which was presented by the representative of the department of public health and preventive medicine. This was followed by the subjective and objective manifestations which was usually presented by a member of the department of medicine, but sometimes by one from pediatrics or otolaryngology. The diagnosis, differential diagnosis,

complications and treatment was discussed by all concerned. A lively and interesting discussion always ensued. By this procedure the subject was presented to the student from all angles, all divergent opinions were expressed and had to be defended if challenged by members of other departments or by the students. In the past from four to five hours had been devoted to the common cold. By the above method, on the other hand, only one hour was used and the students appeared to know more about the common cold with the latter than with the former method. The advantages of this method of presentation soon became apparent to most of the participants and the list of subjects presented in this manner gradually increased to include poisonings, arthritis, contagious diseases and certain endocrine diseases.

In scheduling the subjects at first they were listed by departments, such as, pneumonia—medicine; pneumonia—pediatrics, etc. This permitted the old idea to persist that medicine is a group of departments and that a disease is different in each department. Later the instructor presenting the subject was scheduled without mention to his department. A written quiz was scheduled at the end of the discussion of a group of related diseases or diseases of a system. The questions for those quizzes were the responsibility of the department presenting the major part of the subject and were obtained from all participants. The faculty member who gathered the questions proctored the examination and the student was not informed as to origin of any question. At a later date, an hour was set aside before each quiz for the students to ask the faculty questions and for the instructors to clarify some aspects which were not clear (Table 4, Saturday,

TABLE 4.

Monday,	March 15—8:00 A. M.	Chr. Nephritis & Chr. Pyelonephritis	Dr. Fowler (2 hrs.)
Tuesday,	March 16—8:00 A. M.	Toxemia of Pregnancy & Chr. Nephritis	Dr. O'Brien
	9:00 A. M.	Pyelitis & Chr. Pyelonephritis	Dr. Mengert
Thursday,	March 18—8:00 A. M.	Congenital Malformations of Urinary Tract	Dr. Flocks
	9:00 A. M.	Diets in Kidney Disease	Dr. Daum
Friday,	March 19—8:00 A. M.	Menstrual Disorders	Dr. Mengert
	9:00 A. M.	Pathology and Female Organs	Pathology
Saturday,	March 20—8:00 A. M.	Symposium on B.P. and Renal Disease	No. 1

Shows part of the schedule for renal disease and a period to answer students' questions.

March 20th). The students were asked to hand in questions regarding the subject concerned which was not clear and a copy of the questions was given to the participating teachers. The hour was allocated to the various members or all of them participated in the manner of the roundtable discussion.

At the end of each trimester all instructors who had participated in the coordination met and discussed the schedule just completed. Many of the glaring defects soon became apparent and were eliminated. It was at this time that all criticisms and suggestions were made. The faculty joined in these discussions with a great deal of abstraction and interest. Rarely were personalities interjected. At times, one man was called on to justify the amount of time which he spent on a given subject. At other times, the differences of opinion present in the different departments came to the fore; some were real and others were only apparent. The schedule for that trimester of the following year was thoroughly agreed on by all participating in the presentation of the subjects.

This is a brief outline of the program as it applied to the clinical courses. Certain advantages accrue from this type of coordination. In regards to the student, the subject matter is presented to him in sequence, all divergent opinions are voiced in close proximity to each other, and frequently have to be defended in front of the student; the subject matter and not the department are emphasized; rumored differences of opinions are eliminated; real differences become manifest and the reasons for the differences stand out in relief; unnecessary duplication is eliminated; subjects neglected previously are discovered and taught; less time is required for didactic instruction; additional courses can be added during an emergency; more time for bedside teaching is permitted and the student is taught by instructors who know what the other instructors are teaching. In regard to the faculty, they soon become aware of the content of the lectures of other members, and their outlook is broadened, their interest is aroused in methods of teaching; their presentation of subject material is frequently improved; advances made in other subjects are realized; the importance of other subjects to the student is recognized and one's own specialty begins to appear in its proper relative position in regards to training medical students.

The reduction of time required to present the subjects which were coordinated was of interest. This reduction in time was accomplished by the participating faculty themselves. They frequently learned that some one else was presenting a phase of a subject better than they or that that particular phase was in reality a subject for another department. The most common cause for reduction in time was the realization by the faculty themselves of the unnecessary duplication, which they eliminated promptly. The reduction in time was 25 per cent in a period of two years. In other words, it became apparent to the teachers that they had been spending 25 per cent more time than was necessary to teach the student the same thing. The members of the pathology department learned that it required one third less time to teach the student more pathology by this method than with the one previously employed. In other words, the pathologists had to spend a lot of time trying to teach the student the clinical significance of a pathologic finding. The clinicians found that they had been telling the student the same or different words for one fourth of the time they were lecturing to him on certain subjects. There is one factor not mentioned here in regards to pathology and that is the level of ability to learn had increased in the junior year over the sophomore year. This factor may account for the 8 to 9 per cent greater efficiency acquired by the members of the pathology department over those of the clinical departments. Undoubtedly much of the time saved by the clinical departments was due to the fact that they had ceased to describe the pathology, because the pathologist was presenting it. The number of hours involved was also of interest. Approximately 500 hours were originally devoted to the coordination. When we recognize that 25 per cent of this was found to be unnecessary duplication, there was a saving of approximately 125 hours for a four trimester period.

The Use of Mixed Task Forces in Medical Education*

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I should like to be able to describe a method which has been tried and is of proven worth, but can only urge the more formal application of a practice which has developed, to varying degrees, in many schools. It is not unusual to have correlation clinics, at which a member of a clinical department presents a problem for his preclinical colleagues and the students in the first two years, or where a member of the preclinical group discusses a diagnostic or therapeutic problem for the students on the wards. In some schools, faculty members belong to two or more departments, or participate in instruction in several by invitation of the department heads. This has proved most valuable for it diminishes the thickness of interdepartmental barriers. Division of a faculty or hospital staff into departments is harmful only when the barriers separating the departmental groups interfere with the care of patients or the training of physicians. A school with only four or five departments could be over-departmentalized while one with twenty might be free from that weakness, if interdepartmental collaboration is free and easy.

I believe it is time to consider expanding these interdepartmental activities into a program for medical care and instruction, following more closely the pattern of the mixed military task forces. These have always appeared in prolonged and difficult wars and made it possible to apply to specific objectives the most effectively coordinated attack. The Gallipoli campaign is a classical instance of failure to use a mixed task force, and the German campaign to occupy the Esthonian Islands, in 1917, as the first model triphibious task force victory. Our leaders, following the examples of the Cretan and Malaysian invasions, have greatly expanded these forces and may equal or surpass their coordination. The essence of the task force principle is the use of all arms under an executive responsible for a given campaign, or part of a campaign, and working with a staff representing various services.

Before giving an outline of such a program, which deans and department heads realize must affect the lines of authority of the executives, may I recall to you the changes which have so greatly modified the idea of academic freedom in our universities and medical schools? Academic freedom began with the right of the students to decide which lectures they would attend, which examinations they would take and which theses they would present. They decided whom they would seek, and pay, for instruction. The curriculum then depended on which teachers seemed best able to prepare the student to obtain the degree or the training which he desired. Only in the broadest sense was the curriculum

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based on required work, for only a few main fields were specified for the various degrees. In the modern American medical school the number of hours of lecture, laboratory and practical work are rightly specified. Nothing remains in some schools, only a few hours of electives in many, for the student's choice. Only in a few schools can he select the wards or teachers who will give him some parts of his practical instruction; in many every instructor is assigned to him, and he can not write the examinations unless he has attended ninety per cent of the ordained exercises. In the old schools, where an instructor's progress depended on his providing lively presentation of topics of interest, young men determined the policy, because the students flocked to them. Thus, Vesalius passed the apogee of his influence before he was 30; Bichat and Laennec equally early in life. Today, all policy is determined, nearly all curricula laid down, by men from 40 to 65. Younger departmental members may be influential or completely ignored. Policies which few students or staff members under 40 would accept willingly can be contained indefinitely under a nation-wide system which means by academic freedom merely security of tenure and autocratic departmental autonomy. This is precisely the status of peacetime military establishments, which only become effective when stress of war places responsibility for planning on the task force rather than on the service chiefs, who are more concerned about their departmental prerogatives than over-all effectiveness.

A return to the type of academic freedom which gave us Harvey and Helmholtz, Newton and Einstein, Lavoissier and Claude Bernard no longer is conceivable. Whether we like it or not, we live in a closely regimented communal organization, but we can try to make the best of it, in medicine as we have in war. The mixed task force here suggested is one way to restore to the medical school the flexibility and youthful leadership which it had in the days of true academic freedom.

The younger members of our faculties, now mostly in military service, have for years spent much time together criticizing and lamenting the policies of their schools. There are not a few Billy Mitchells, Chennaults, and Major Carlsons in medicine, men of vision and ability who have gone it alone rather than put up with reaction and inertia. These are the men whose talents should be utilized in organizing the task forces of medicine, with authority to form policies. Much of the responsibility for carrying out policy will also fall on the task force executive and his assistants, and they will report on the effectiveness and the faults of each year's work.

The program would begin by selecting the executives for various tasks, and here the dean and department heads would be responsible. The exact groups would vary in different schools,—thus in one school one task force might cover cardiorespiratory disease, while in another cardiovascular and renal disease might be grouped together. But the task forces would always apply to systems, not to etiologic groupings, and together would cover the whole field from skin to bone. The men selected as executives would submit the names of staff members to assist them; they would be free to ask help in teaching or in policy making from

any faculty member. Each group would spend some months working out its program, covering instruction in one field from the freshmen to the residents. The facilities actually available, and the facilities and instructors desirable and possibly attainable in the near future should be considered. With the department heads and dean they must determine what they actually could count on when the program goes into effect, and by conference with other task force leaders and the dean, they could determine what curricular changes could be effected by the time the operation begins. Working within these limitations, and overcoming them so far as possible, a program of integrated instruction would be planned, not to avoid repetition, but to be sure each repetition is based on knowledge of previous work, approaches from a new angle, and that each brings to bear the most appropriate methods and most competent and interested teachers.

In planning this program, the faculty, the house officers and recent graduates should be polled to discover the defects and deficiencies in the existing courses. The ideas on instruction of the various staff members should be recorded, with the parts of the program in which they would like to participate. But in the end the executive and his small staff are responsible for the program submitted and for securing the cooperation of men and departments necessary to carry it into effect. The use of men best able to teach in any part of the schedule would be effected with no regard whatever to the departmental affiliation. Teaching as a part of the method of educating house staff would receive proper consideration, so that younger surgeons and radiologists could perfect their knowledge of anatomy and pathology, and in other departments further training in physiology, microbiology and biochemistry would be obtained by participation in laboratory teaching and in research.

It is apparent that what is here proposed is organization on the so-called vertical plan, to be integrated with and not to replace the present horizontal system. The vertical plan alone would certainly lead to further heightening of interdepartmental barriers and serious overdepartmentalization in its worst aspect. Continuation of our present horizontal method would be far better than a series of clinical departments, complete from biochemistry and embryology through to preventive medicine. Each of these would soon have a miniature of each other clinical department, or at least it is probable that some clinical chiefs would want their own pediatricians, psychiatrists, surgeons and internists just as they now have their private pathologists and bacteriologists. Department heads always are the most concerned about their own principalities; the younger staff members do not object to working with their contemporaries in other departments. It is by capitalizing on this fact that a more effective and fruitful program can be organized, without taking up more time of the present executives. It would utilize the intense interest and obvious executive ability of the junior staff members, and the energy which is now wasted in sterile "gripe" sessions.

Following the recent publication in *Science* of curves of productivity of men in various fields of investigation, and an address by a chemist on the greater

inventive genius of men under 40, a number of eloquent contributors intimated that although productive ingenuity has passed its peak by 35, executive ability increases for many years thereafter.

Can any one point to more brilliant executive work than that of Nelson in the campaign ending with the destruction of the French fleet on the Nile, or in recent times the organization of Pan American Airways by Juan Trippe or of *Time, Life* and *Fortune* by Haddon and Luce? These were done by men well under 40. Charles of Sweden organized his armies and defeated the Russians at the age of 18. Maurice of Nassau reorganized the shattered forces of the Dutch and drove out the Spaniards before he was 21. William Pitt, at 24, became Prime Minister, after Britain was humbled by her colonies, and before he was 30 made himself one of the outstanding prime ministers in the long history of England. The peak of executive ability, like that in all other fields, is usually passed sometime between 25 and 35.

Good young men, if put to use and not allowed to grow stale or frustrated, may remain good for decades, but as discoverers, organizers and executives it is apparent from the history of war, of industry and of government that they are most effective before 40. They can be best utilized by making them chiefs of staff, as some of them now are, and as chiefs or members of the staff of task forces. We older executives must be responsible for selecting the men to head the task forces and for their seeking the right objectives; we must make certain that our departments are well staffed and properly equipped. These are like the duties of the commanders of the Ground Forces, Air Forces, Navy and their various branches. Thus the task force commanders can obtain great freedom and full support in planning and carrying out their programs. By such teamwork the teaching of physicians and the care of the sick can be strengthened and the healthiest academic atmosphere created.

One of Nelson's captains said, when asked the secret of their success, "We were a band of brothers." Without that atmosphere, there can be no long-sustained and effective teamwork. Without teamwork there no longer can be adequate care of patients or adequate training of physicians.

Correlation of the Medical Curriculum*

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Medicine has advanced from the simple art of clinical observation to a highly complex science which touches nearly all biologic and physical sciences and the humanities. The mass of information is so great and the interpretation of observations so difficult that it has been necessary to organize medical knowledge into spheres. There has resulted specialization in practice and teaching which frequently progresses to an absurd degree. This specialization, though necessary to encompass all the details of a given subject and though desirable for postgraduate instruction, has often limited the vision of the individual teacher and restricted his ability to evaluate for the student the relationship of his small field of endeavor to the broad art and science of medicine. In spite of this evolution of the science over a period of two thousand years, the basis of medical practice is still one man—the doctor—at the bedside assuming responsibility for one patient. On this fundamental doctor-patient relationship modern medicine rests. The highly localized lesion seen by the specialist results from the same underlying processes of disease observed by the general practitioner. For this reason correlation—the attempt to tie together widely scattered phases of medicine into one coherent whole—cannot be haphazard, but must be very carefully planned in philosophy and detail of execution.

The establishment of a new school offers an unexcelled opportunity to break the shackles of tradition and attack this problem unhampered. No hoary customs oppose change of philosophy, and no vested interests resist alterations of emphasis or time allotted specific courses. When the Bowman Gray School of Medicine was organized in Winston-Salem in 1941, an effort was made to reduce departmental isolation and to approach the integration of the curriculum with an experimental attitude. The educational advantages have not been reduced by this experiment, and the time allotted various subjects is the same as in more orthodox curricula.

The opinion is widespread that the medical curriculum needs overhauling. Revision and simplification are long overdue. The medical curriculum, however, is intimately connected with the content of the premedical course and must also consider the internship year if this is a prerequisite to obtaining the diploma. Curricular changes involving these years cannot be made by a single school, but must be adopted widely. Therefore, we have attacked this problem of correla-

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tion within the framework of the conventional medical course. We will discuss only what is now actually being done in our school. Our thinking and planning for the future are still undergoing evolution; we have discussed several experimental curricula.

Contrary to rumor, we still teach anatomy. Actual time spent in the dissecting laboratory amounts to 372 hours. The departments of anatomy and surgery are combined, with a professor of anatomy and a professor of surgery. During the course for freshmen, one fellow and two assistant residents in the department of surgery serve as instructors in the dissecting room, assisting the professor of anatomy. The essential feature of this plan is that it provides competent instructors and proper correlation from the beginning of the medical course.

In planning our approach to correlation teaching, we have assumed that the majority of medical students expect eventually to practice as physicians. The preclinical years frequently come as a shock to students who have visualized medicine as revolving around the patient. Too often there results in the student's mind an artificial separation between clinical and preclinical sciences, between laboratory work and the art of medicine. Especially is this true in those institutions where physical facilities for preclinical work are separated from facilities for clinical work. We are attempting to break down this artificial clinical-preclinical barrier. In the practice of good medicine it is impossible to separate

TABLE 1.—CLINICAL INTO PRECLINICAL.

FROM	TO	YEAR	TYPE OF INSTRUCTION
Surgery	Anatomy	I and II	Introductory Clinics
Surgery and Medicine	Biochemistry	I and II	Introductory Clinics
Medicine and Neurosurgery	Physiology	I and II	Introductory Clinics
Surgery	Pathology	II	Laboratory—Animals
Medicine	Pathology	II	Pathology Clinics
Medicine	Pharmacology	II	Pharmacology Clinics; patients on ward
Medicine, Pediatrics and Obstetrics	Preventive Medicine	II	Preventive Medicine Clinics
Medicine	Clinical Microscopy	II	Clinics in Clinical Microscopy
Pediatrics and Medicine	Bacteriology	II	Bacteriology Clinics

clinical from preclinical knowledge, for one must constantly refer to the basic sciences for an accurate and scientific approach to the diagnosis and treatment of disease in the individual patient. We believe that the student must be well-rounded and firmly grounded in fundamentals before he can logically reason out the correct diagnosis and therapy.

The correlation teaching has been arranged in four phases: (1) clinical into preclinical; (2) preclinical into clinical; (3) clinical into clinical; and (4) postgraduate into preclinical.

CLINICAL INTO PRECLINICAL

The first phase of our correlation has been planned so that preclinical students may see the clinical application of subjects which otherwise might seem academic while under study. This plan leads to a better understanding that the preclinical sciences are not ends in themselves, but tools with a "practical" application in the study of an individual patient. The student is thus stimulated to apply himself more vigorously to the study of the subject at hand.

Introductory clinics are held each Saturday morning for freshmen and sophomore students. During the first one and one-half trimesters, the department of surgery presents cases which demonstrate the practical anatomy covered in the dissecting room during the preceding week. For example, when the dissection of the back and adjacent portion of the upper extremity has been completed, a patient with a healing pulmonary lobectomy wound is presented. The anatomical landmarks and the structures severed in reaching the thoracic wall are reviewed. No operative techniques are discussed; the entire emphasis is placed on the anatomy of the living subject. These clinics stimulate sophomore students to return to the dissecting room druing their spare time and to reread anatomy. In the same way, cases of diabetes, nephritis, heart failure, jaundice, and other appropriate conditions are presented by the Department of Medicine during the remainder of the year while the courses in biochemistry and physiology are in progress.

Frequently, as a by-product of correlation, the preclinical teachers are stimulated to alter the content of courses. In the long run animal experiments are but another method of demonstrating what occurs in the human being. Effort is now being made to teach all possible phases of physiology on human subjects, using the students themselves, or patients. Fresh teaching techniques may result —for example, the increased use of living animals and supravital dyes, not just "fresh tissue," in the study of histology. By the use of cold light focused at the point of observation, water immersion lenses, and supravital dyes, the student is enabled to get an entirely different concept of the function of the kidney or liver from that which he might obtain by study of fixed, stained, loan collection slides alone. This technique was suggested by a clinician who was interested in supravital staining of blood cells for hematologic study, and was adapted by the instructor in charge of Histology to his teaching.

The emphasis in toxicology has been switched from the autopsy in the medical examiner's office to the effect on the patient of materials encountered in various occupations. Autopsy legal medicine is a specialty which requires highly technical postgraduate training and therefore has little place in an undergraduate curriculum. Only a few students will become coroners or medical examiners, but nearly all will act as physicians to employees of small industries which may not be able to support a full time physician in the plant. Toxicology has become an introduction to industrial medicine.

PRECLINICAL INTO CLINICAL

All too frequently students breathe a sigh of relief on entering the wards as clinical clerks. They are convinced that at long last the study of their life's work has begun. On the wards, the student learns habits, particularly in the therapy of disease, and forgets to reason from underlying principles. Unless the foundation stones are firmly placed, he cannot carry his reasoning over from one disease to another. For instance, a patient with a severe burn has recognized and well understood physiologic disturbances which can be readily demonstrated by blood chemical alterations. These same alterations may occur in infectious diseases in

which capillaries are damaged and in which protein may be lost from the blood stream. Such is the case with Rocky Mountain spotted fever. The student is inclined to forget that the principles of fluid balance are the same, regardless of the underlying etiology, and that the patient may be harmed by the forcing of crystalloids. The routine "therapy for infectious diseases" which he has learned by rote or habit may include this practice. It can be very forcibly impressed on the student that the care of patients should be individualized and that clinical medicine should be based on a thorough understanding of fundamental preclinical sciences—that pathology is the basis of diagnosis, and that physiology and pharmacology are the bases of therapy.

TABLE 2.—PRECLINICAL INTO CLINICAL.

FROM	TO	YEAR	TYPE OF INSTRUCTION
Anatomy	Medicine and Obstetrics	II	Lectures
Bacteriology	Medicine	III and IV	Practical bacteriology
Pharmacology	Medicine	III	Therapeutic ward rounds
Laboratory	Medicine	III	Ward rounds
Pathology	Obstetrics-Gynecology, Surgery	III and IV	Gross and microscopic examination of operative specimens
Physiology and Chemistry	Medicine	IV	Lectures and patients
Pathology	Medicine	IV	Gross autopsies

In the second year, a series of lectures with emphasis on the anatomy of the thorax is given by the department of anatomy in conjunction with the course in physical diagnosis. The relation of surface anatomy to the production and transmission of physical signs is stressed. In the introductory course in obstetrics and gynecology, the anatomy of the pelvis and perineum is reviewed similarly.

To impress on the clinical clerk the importance of the basic sciences, the oral examinations in Junior Medicine emphasizes the physiologic, pathologic, biochemical, and bacteriologic aspects of the cases worked up on the wards. The clinical aspects of disease are covered in examinations in Senior Medicine.

During the senior year, preclinical instructors in biochemistry, physiology, and pathology meet the class for one trimester each. No clinical instructor above the rank of house officer is present, so that questions are asked freely. The clinical chemist selects data of interest as routine tests come through the laboratory. The patients on whom the tests were done are presented and the findings discussed. Although this course is under the direction of the Department of Medicine, patients on pediatrics, surgery, or obstetrics are used freely. The principles of disease are the same, regardless of the service on which the patient may be.

CLINICAL INTO CLINICAL

Interdepartmental correlation in the clinical years is widely practiced. We have assigned a student on pediatrics and a student on surgery to the same surgical pediatric case. The care of the newly-born is discussed with both pediatric and obstetric students. In medicine the theoretic aspects of nutrition, the practical aspects of dietetics, and the application of dietary measures in

specific disease processes (such as allergic conditions) are correlated on successive days by ward rounds, discussion groups, and the preparation of actual meals in the dietetics laboratory.

It should be stressed that the clinical department listed in the tables is not the only one participating in the correlation, but is the one which has assumed responsibility for adequate coverage of one particular subject. For instance, in the introductory clinics in anatomy, which are listed under surgery, the pediatrician may show embryologic defects and the surgeon the application of gross anatomy to operations. All departments are participating in some way.

POSTGRADUATE INTO PRECLINICAL

The treatment of patients on the basis of habit ("routine orders for tonsillectomy") is a fault even more marked in house officers than in clinical students. Educators tell us that we learn best by repetition; hence, a house officer will find that restudy of a preclinical science at some phase of his postgraduate training will give him a better understanding of fundamental physiology, pathology, or bacteriology than he had when he took the course as an undergraduate. We give no formal courses for house officers. Staff conferences for discussion of unusual cases or for review of recent advances in a subject are held regularly by all departments. Because the discussions have proven stimulating, members of the house staff and faculty from the departments of pathology, clinical chemistry and radiology regularly attend the staff rounds of other departments.

TABLE 8.—POSTGRADUATE (HOUSE OFFICERS) INTO PRECLINICAL

FROM	TO	REMARKS
Medicine	Bacteriology	One assistant resident assigned to bacteriology laboratory to supervise practical bacteriology.
Medicine	Physical Diagnosis	All house officers assist in actual teaching.
Surgery	Anatomy	Assistant residents in surgery rotate through Anatomy Department and assist in teaching of gross and neuroanatomy.
Surgery	Pathology	One assistant resident assigned to Pathology Department to assist in autopsies, surgical pathology, and teaching.
Obstetrics	Pathology	One assistant resident in surgical pathology.
Pediatrics	Preventive Medicine	County immunization clinics.

For special training in some basic science, house officers are assigned to a preclinical department for specific work. It is an axiom that to master a subject, one must teach someone else; hence, we have freely used house officers as assistants in correlation teaching of preclinical subjects. House officers are encouraged to do a simple research problem with clinical application.

COMMUNITY CORRELATION

In an attempt to show how the physician's work is woven into the fabric of community life, an informal course known as Broader Aspects of Medicine is held irregularly; students, house staff and faculty are invited. As suitable speakers are available, visitors such as returned medical missionaries, business men, social or welfare workers, physicians from isolated mountain areas, lawyers, insurance men, and ministers discuss some phase of their work related to medicine.

TECHNIQUES

We would like to discuss in some detail examples of what we are attempting to do. As an illustration of the technique used in clinical into preclinical correlation, we have instituted clinics in pathology during the course in the second year. The material which is handled in the laboratory is inanimate and fixed, and usually demonstrates terminal lesions of a disease process. It is difficult for the student to think in terms of a dynamic, continuing, active process. It is also difficult to visualize the effect of disease processes on the entire body when the lesions seen are predominantly in a single organ. In the study of rheumatic fever it is difficult to find pathologic material, other than hearts, which shows gross lesions, although microscopically the student can see changes in other organs. The impact of observing a patient with acute rheumatic fever, complaining of joint, chest, and abdominal pain and showing skin lesions and subcutaneous nodules, as well as heart disease, indelibly impresses on the student's mind that rheumatic fever is a disease which affects the collagenous connective tissue wherever it may be found. Similarly, the student thinks of nephritis as a disturbance of the kidney, with lesions predominantly in that organ. When he sees an edematous person with an enlarged heart and pallor, it can be impressed most forcibly that nephritis affects all arterioles in the body and is a generalized vascular disease which can be recognized first in the kidney and which may have its most marked lesions there.

In the course of such a clinic, we try very subtly to impress several things on the student. Since the student has become a callous sophomore who thinks in terms of the autopsy room, the patient is wheeled into the clinical amphitheater, where the atmosphere suggests the care of a patient rather than the study of a disease process. No one presents the history. The clinician extracts from the patient a simple history, using only lay terms which all preclinical students can understand. This teaches that in history taking one must use language which the patient can understand, and that questions must be carefully phrased so as not to be "leading." As points in the history are brought out which are illustrated by definite physical signs, students are called down to examine the patient. Since they have not had physical diagnosis, attention is called only to lesions which can be seen by the unaided eye from seats in the amphitheater. Signs which can be described by the student to the remainder of the class are elicited. For instance, if a case of aortic insufficiency is shown, the student will feel the pulse, recognizing the incompressibility of the pulse because of the increased systolic pressure and the forceful character and collapsing nature of the pulse as seen in the neck veins and felt in the upraised arm. He then can use other students as controls to determine if these observations are alterations from the normal. This practice impresses on the student the principle that all observations must be evaluated in the light of a normal standard. The enlargement of the heart can be shown by the forceful apical impulse far out in the mid-axillary line, and the edema of failure can be seen and felt. A short review of the causes of edema from the standpoint of physiology can be given. It is interesting that many students have never realized until they have

reached the senior year that the fundamental approaches in history taking and physical diagnosis were being taught. Suddenly, they recognize that the proper approach to such problems has been shown them since the first week of teaching anatomy.

In pharmacology, the clinic is staged in the laboratory in an atmosphere which may seem far removed from the care of patients. The patient is allowed to tell his story in simple words. The physiologic disturbances suggested are discussed as the symptoms are related. If laboratory data are needed to confirm a suspicion or to decide which of two processes might be active, reference is made to the clinical record. A patient with peptic ulcer will describe clearly peristaltic pain, symptoms of hyperacidity, and the effect of emotional distress. As these symptoms are listed, the pharmacology of the drug to attack each one can be discussed. The patient's observation of foods which give symptomatic relief can be discussed in the light of nutrition and food chemistry. From a discussion of the amphoteric action of protein in food serving to inactivate free acid, it is but a simple step to a discussion of the use of inorganic amphoteric substances as antacids. The correct interpretation of the patient's story leads to an understanding of the underlying pathologic physiology and the principles of the pharmacologic approach to therapy.

To emphasize further the use of pharmacology as a basis for therapeutics, second year students during the course in pharmacology are assigned to two cases on the medical ward which are clear-cut examples of disease processes that respond to drug therapy. The diagnosis made by the medical department is assumed to be correct. The student reviews the record to determine what is the fundamental physiologic or chemical disturbance. The effectiveness of the types of therapy being used is critically examined. For instance, the increase in vital capacity in patients with cardiac failure, the loss of weight in patients with edema, and the reticulocyte response to the administration of liver in pernicious anemia are used as criteria. The mechanism of action and any toxic manifestations of the drugs used in therapy are noted. The second year student discusses the cases with the third year clinical clerk as well as with the instructor in pharmacology. This discussion serves to impress on the junior clinical clerk also the importance of pharmacology, and usually results in his reviewing the subject, so that the second year student will not ask questions for which he does not know the answer. The patient is followed until discharge or transfer to another service. On completion of the study a comprehensive written summary, based on the student's observations, is submitted to the professor of pharmacology.

The clinical clerks do all bacteriologic procedures on patients assigned to them. At the discretion of the house officer, these may be duplicated by the hospital laboratory. The spirit of competition is thus introduced and there is friendly rivalry between the technicians in the laboratory and the students to demonstrate etiological agents. No student is required to perform a more complicated procedure than he could do in his office if he were a practicing physician. If he cares to carry his study beyond this, he may elect to do so. The result is that the student is thoroughly impressed with the value and limitations of simple

bacteriologic studies. The proper time in the course of the illness to do cultures of blood, urine, stool, or biliary drainage can be correlated with the pathology and symptoms of typhoid fever. The student is reminded that laboratory tests are helpful only when positive, that each carries an inherent error, and that his interpretation must be guarded by a knowledge of the pitfalls of all laboratory examinations. The applications to (1) diagnosis and (2) treatment can then be discussed in appropriate ward rounds.

CRITIQUE

We recognize that such a program is not without some danger. The thought has been expressed that students may be abetted in a desire to skip over preclinical subjects. The testimony of both students and faculty, however, refutes this objection. The criticism is made that clinicians are attempting to push clinical medicine into earlier years. We recognize that the teaching may tend to appear more clinical than preclinical, but this criticism is one of technique or method rather than of content. Once the student recognizes the need for the fundamental sciences in understanding disease, the teaching of the basic courses becomes more effective. The men who do the correlating are the key to the whole program. The pure clinician cannot do it. The work must be pitched at the level of the first or second year student, and the instructor must have reviewed the preclinical science involved. The preclinical instructor must also appreciate the fact that he is teaching future practicing physicians. We have discovered that the average practicing physician does not make an effective correlation teacher. The attitude with which the teaching is approached is as important, or perhaps more so, than the ability of the personnel.

SUMMARY

A carefully planned program of correlation teaching will lead to the stimulation of student and teacher and to a better understanding of fundamental disturbances in disease and the principles underlying the approach to diagnosis and therapy. The attitude with which correlation is approached and the aptitude of the individual instructor are the keys to a successful program.

DISCUSSION

DR. E. STANLEY RYERSON (University of Toronto): I would like, in the first place, to congratulate the readers of the papers with regard to this question of integration. I heartily agree with Dr. William Dock regarding the younger man. It has been one of my hobbies for a number of years. You may be interested in an example. I happened to learn from Flexner's Life of William H. Welch, that he described the first medical faculty of Johns Hopkins where the heads of departments were between 30 and 40 years of age.

I was also interested to learn that the Director General of the Medical Services of the whole Russian Army is a man of 37 years of age. The young man is the one who is really going to do the constructive work and pull things to pieces and try to put them together better than we have in the past.

I would like particularly to congratulate all these readers because they are each individually, in their own schools, trying a new experiment. There is just as much op-

portunity for experiment in education as there is in the sciences of the individual departments. As a result of these experiments, something good is unquestionably going to arise.

It was not necessary in the old days, when I began my medical course some 48 years ago, to have such papers as we have had this morning. The Professor of Anatomy was also a Professor of Surgery, at least he ultimately became a Professor of Surgery. All the staff was composed of general practitioners, the only specialists being in eye, ear, nose and throat diseases. The Professor of Physiology was a physician and Medical Officer of Health. The Professor of Bacteriology became a leading obstetrician and so on with the other members of the staff. The clinical staff were all general practitioners. So, in that way, there was constant integration between the departments of anatomy and surgery. Many men went into pathology and then into surgery so that when they became clinical teachers, they carried out this process of integration.

With that brief introduction, I will endeavor to reduce what I have to say by reading what I have written because I am a little apt, I know, to be verbose and overdo a point, but I have another experiment to suggest.

The medical curriculum of today was not planned deliberately for "accident rather than reflection or design has very largely made medical education what it now is in different countries" (Flexner). Its perpetuation is the result of each successive generation of doctors being the educators of the next generation and although vast additions to medical knowledge have been made in the past fifty years, basically the curriculum continues the same. In the early part, the student is taught anatomy and physiology and later, the clinical subjects. The courses in anatomy and physiology are thought of as "preclinical" subjects, that is, as a preparation for their application in the clinical years and in the practice of medicine. The philosophy of these courses in anatomy and physiology, as they have been taught, is so different that no integration of them has ever been possible or ever will be.

Tradition has been the cause for the perpetuation of these incompatible philosophies and this tradition can be changed only by a revision in the philosophies of the teaching of the structure and functions of the body. Is it not possible that a knowledge of the structures and functions of the human body might be taught with some other purpose than merely for their application in the diagnosis and treatment of disease? Why should not a knowledge of the structures and functions of the human body be taught for the definite object of enabling a person to understand the fundamental principles of health, so that he may be able to live a healthier life? It is just such an education that is being sought by the educators who plan the courses in the primary and secondary schools of all civilized countries. They urgently need teachers with this kind of knowledge of the body in health and of the many other factors that are included in what they describe as health education. *For example, John W. Studebaker, U. S. Commissioner of Education, in an address on "Planning for Health Education in the War and Post War Periods," at the American Public Health Association in October, 1943, said, "In a platform of health education for the post war period—first, there is need for a more adequate and properly graded program of health instruction in every school in the land. There is particular need for greater stress on this subject matter in the high schools, where students have sufficient maturity to understand the physiologic and scientific background information for healthful living."

Why should not the departments of anatomy and physiology in the medical schools undertake the giving of this instruction to students desirous of qualifying themselves to become teachers of health in the high schools of the country? Were they to attempt to give such instruction, what would be the philosophy of such courses of instruction and how might the two courses be integrated?

The objective of such courses would be the attainment of a knowledge of the structures and functions of the body in their relation to health. But what is health? How

* Public Health Reports, July 14, 1944; Vol. 59, No. 28, U. S. Public Health Service.

can its principles be defined? It cannot be thought of simply as "the normal" in contrast with "the abnormal" or diseased, as has been the custom in the medical courses in these subjects. If health is a positive condition, a definite entity, of what underlying principles does it consist?

In the first place, it is something which only exists in living things; that is, it occurs in anything and everything that lives and, conversely, is never found in inert materials or dead things. In order to acquire a knowledge of structure and function in relation to health, it must be studied in living organisms and not only in the dissecting rooms or laboratories. Secondly, health varies in relation to the quality of the structure of an organism or of any of its parts. Quality of structure in a living thing may vary from a standard of great excellence at one end of the scale to a very low standard at the other end, with all shades of difference in between; it may be so impaired by loss of its quality as to be completely altered in its characteristics. Quality of structure as evidence of health can be investigated and assessed by taking a health history and making a health examination, i. e., by using the same scientific methods to assess health as the doctor does to diagnose disease. Quality of structure has a direct influence upon the function that a structure performs because a structure of good quality will carry out its particular function more efficiently than a structure of poor quality. In other words, structure and function are interdependent on one another, for not only is a function carried out well if the quality of a structure is good, but the performing of its function tends to improve and maintain the quality of its structure.

Thirdly, health varies in accordance with the degree of efficiency with which an organism or one of its parts performs its functions, i. e., if an organism performs its functions with a high degree of efficiency, its standard of health will be high, and vice versa. The efficiency with which a function is performed can be investigated, examined and assessed in the investigation and examination of the well person in the same scientific manner as the doctor now uses in the diagnosis of an illness. In the latter case, he bases his opinion on the evidence he finds of diseased structure and impaired function, while in the former, he can judge the standard of excellence by the quality of structure and the degree of efficiency in the performance of function and thus assess the health of the organism or part.

The application of these principles to the simplest form of living things, a unicellular organism, can be comprehended without difficulty. For example, in an amoeba, its health can be assessed by examining the quality of its structure and the efficiency with which it performs its main biological functions of movement, nutrition and metabolism, responsiveness to stimuli, and of reproduction, growth and development. It is also necessary to determine the degree of satisfactoriness with which the organism is adjusting itself to the environment in which it is living, as the degree of its health is related to this factor also. The quality of the structure of such an amoeba will be influenced by the quality of structure of the parent organism from which it has arisen or, in other words, by the hereditary factor.

Health. A course based on these principles might be given in the first and second years concurrently with the study of the gross and microanatomy of the body structures and of the functions these perform under the broad functional headings: (1) movement: physical activities; (2) nutrition and metabolism; (3) reproduction, growth and development; (4) responsiveness to stimuli; (5) the manner with which these cooperate with one another; (6) the adjustment of the organism to four environments: lithosphere, hydrosphere, atmosphere, biosphere. Such a synthesizing scheme would result in an integrated course in the freshman and sophomore years.

Such a course would be rounded out by teaching the process of health assessment in the individual-as-a-whole, the same methods which are used in the making of a diagnosis of disease being applied to assessing the degree of health present. In accordance with the standard of health found in the person, the methods, by which a good standard of

health is maintained, a moderate standard can be promoted and a poor degree restored, would be instituted. Broadly speaking, these methods are the use of physical activity as taught in the courses in physical education, the application of the known principles for improving nutrition, metabolism, growth and development, the adoption of mental hygiene knowledge for overcoming emotional instability, and the giving of advice to help the individual to adjust himself to his social, educational, industrial or other environment.

The instruction in health assessment and promotion might constitute the initial phase of the course in physical diagnosis. Experience might be obtained in learning the methods of inspection, palpation and testing of functions for the purposes of assessing health, (a) by acting as assistants in the first examination of students in the university health services, and (b) by the study of hospital patients as sick persons and not as medical, surgical or other special types of cases.

When teaching begins in the hospital wards, the methods of diagnosis would be applied primarily to the determination of whether the part of the body examined and the person-as-a-whole is healthy or diseased and if healthy, the standard of health present, e. g., A, B, C, D, E, or the *PULHEMS profile, such as:

P	U	L	H	E	M	S
I	I	I	I	I	I	I

Fit in every way.

or

P	U	L	H	E	M	S
I	I	I	I	I	5	I

Fit physically but too low in mental ability to be useful in army.

Were such a method adopted, students would gain a realization of health and its variations at the same time as they are learning to recognize the signs and symptoms of disease. One of the great defects, in the clinical courses, is that the great majority of patients in hospitals used in the teaching of medical students are affected by definite diseases with obvious physical findings of structure and function, whereas in the general practice of medicine, patients of this type, which require to be sent to hospital, only constitute 20% to 30% of the conditions for which the doctor is consulted. The first thing a general practitioner has to do when a person, who thinks he is sick, comes to him, is to find out whether he has a disease or whether he has some structural or functional impairment of his health, which can be overcome by changing his way of life.

Before he goes to the doctor, the person has to make the first diagnosis, i. e., that he is sick, a system which is far from satisfactory as the average individual has little or no knowledge either of the manifestations of health or of the symptoms and signs of disease.

Some time in the future, a system of medical practice will come into operation in which this first diagnosis of sickness or health will always be undertaken by the doctor who is specially educated for this purpose. "Through an organization, such as the **Pioneer Health Centre (London, England), the onus of the detection of ill-health is removed from the patient, who is ignorant of the nature and also of the presence of the disease, and is placed in the hands of the doctor who is trained to carry that particular responsibility."

Were the clinical teaching, in the latter part of the second and the whole of the third year of the medical course, to be devoted to the study of the patients in all wards, i. e., medical, surgical, etc., as sick persons, medical students would acquire an integrated conception of the kind of work a general practitioner has to perform. In the fourth or

* Physical Standards and Instructions. For the medical examination of serving soldiers and recruits for the Canadian Army.

** The Case for Action, by Innes H. Pearse, M.D., B.S. (Lond.) and G. Scott Williamson, M.C., M.D. (Edin.); Faber and Faber, Limited.

final year, instruction might be given on many of the same patients using them to illustrate the special features of diagnosis or treatment.

DR. DON SLAUGHTER (Southwestern Medical College): A sad commentary has been indicated here this morning. I think that, perhaps, heads of departments of some medical schools hardly know each other, or, if they do, they do not speak to each other as they should. All of us agree, I am sure, that correlation in medical teaching is needed and, yet, I wonder why it is that so often some departments have secrets from other departments.

They seem to be afraid sometimes to tell the other department what they are teaching if they are teaching something which comes up in their department as well as another. I wonder also, since from infancy we learn best by repetition, if we should not consider that there might be planned repetition in teaching in medical schools. I am sure that a certain amount of planned repetition is vitally essential.

In this regard, it is interesting to note that, I believe in most medical schools, planned repetition to some degree in the clinical sciences is condoned, while repetition of any sort in preclinical sciences is frowned upon. I should like to add to Dr. Harrell's suggestion that we have a Department of Structure and Function and Clinical Instruction. There are two other departments which I think are vitally important. One is the Art of Medicine. I believe that the art of medicine has been overlooked in the last few years in our haste to place too much emphasis on laboratory and other mechanical forms of diagnosis. Also, we must face the fact that now if a child gets through the ordinary childhood diseases that his chances of dying are quite remote unless he is killed accidentally, dies of heart disease, cancer or one of the virus infections for which we have not found a cure.

This means that more and more we are going to have old people and because we have them, we can't turn aside and do nothing about them. So, I believe that a very important department which is necessary, as new therapeutic agents are brought out, will be a Department of Geriatrics and the medical schools will be responsible, not only for keeping the older man healthy, but they will be responsible, I believe, for the social and economic difficulties which will arise as men grow older and older.

I repeat that all of us, I feel sure, realize that medical teaching must be correlated, but I would like to suggest that perhaps if there is such a thing, heads of departments in some medical schools who have secrets should get together sometime and let their hair down.

DR. ERIC OGDEN (University of Texas): I think we all very much enjoyed Dr. Dock's little talk on logic and logistics and I want just to take a moment to report to you a campaign, a short and rather unsuccessful campaign, which was put on by some of the faculty at Galveston. It was somewhat hastily planned and there was no commander in chief and it failed, but the reason for reporting it to you is the same reason that many of you attend clinical pathological conferences. I think from the report of this failure we can learn something and I think we can plan more effectively another time.

One of the reasons that Dr. Greene was able to show a gain in time by his plan of teaching which he described was because bringing all the clinical disciplines together held the students' attention so that the student was highly motivated all the time to what he was learning. In that way, twenty-five per cent of the time was gained. It may have been gained some other way, too, but I think the question of motivation is of prime importance.

In the first year we have a great deal of trouble with motivation because the boys have been spending three years, roughly speaking, hoping to be doctors and learning a lot of things which help to get them the grades necessary to get them in medical school.

Then, when they come to medical school to learn to be doctors, they are thrown into laboratories to see dogs and into laboratories to see cadavers and microbes and they are still not apparently going to be doctors.

We conceived the possibility that we could take a little time at the beginning, four weeks to be exact, in which we could direct the students' attention to the fact that they could use in medicine such of those premedical required subjects as they had taken the trouble to learn and retain and that the subjects which they were just about to study, particularly anatomy, physiology and biochemistry, were essential tools for the practice of medicine.

To that end, we somewhat hastily put together a course in which they had for four weeks, thirty-five hours a week, to devote to medical genetics, vertebrate morphology, biophysics; (by which I mean an attempt to point out to them in the most general terms the way in which the physics which they had or had not learned should be applied to their future work) a survey of applications of biochemistry, some instruction in the proper and effective rapid use of a library and some instruction in military science and tactics, the reason for which I will not go into now. That curriculum was carried out with the cooperation of the various departments involved; and at the end of the time, we surveyed the good or ill done to our students by that curriculum. Those students have not yet completed another semester of normal work so we can't be sure how much good or harm we have done them.

But I have one or two brief observations to make on that point. It seems that the objective of a preliminary course should be clearly defined and adhered to and modified after careful consideration. The prime thing, I think, is that the psychological moment when a man enters medical school, as a result of years of looking forward to and active preparation for it, is the moment in his life which should be utilized to the fullest. We failed to do that, first of all, because these courses were set up, as I have told you, of so many hours of a number of subjects which looked to the student somewhat like another set of college courses.

The students were not clearly informed of the importance of this work and were inclined to think that maybe it was just another set of courses. For that reason, not enough work was demanded of the students at that time. We have, I think, failed notably, not only in this experience, but much medical teaching has proven that the more you demand of a man, the more he goes after it. We did not demand enough work of them. The students at this time did not have enough direct contact with real things. We should have, I believe, shown them a patient to illustrate to them why they were going to be interested in chemistry. We should have taken them straight into the dissecting room to show why they were going to be interested in the general phenomena of vertebrate morphology. Those are the prime reasons for failure.

In conclusion, I would like to say that we propose to try to achieve this same object with another mixed task force, I hope with a commander, certainly with a task force which shall be mixed in such a way that it stays mixed and does not settle out like so many of these poorly made emulsions.

One of the recommendations which I would make is this: An introductory course at the beginning of medical school should be designed with the idea of assuring the medical student that his premedical studies in the past and clinical studies in the immediate future are directly aimed at his ultimate life work, which is the practice of medicine.

In conjunction with this, the ability to apply the preclinical sciences should be dramatized by the introduction to the students of the applications of his work to patients right from the beginning, not training him to be a half-baked clinician in his first week, but showing him that a patient with edema is as good a text for discussion of biochemistry or physiology as is a dog or microscopic slide.

Final Report of the Committee on the Teaching of Preventive Medicine and Public Health*

This Committee was appointed by the Association of American Medical Colleges at its annual meeting in 1939. The purpose of the Committee is best expressed in a letter from the Secretary of the Association to the Chairman of the Committee under date of November 1, 1939, as follows:

"Pursuant to the request of the American Public Health Association that this Association appoint a committee to cooperate in formulating a program for the education of undergraduate medical students in preventive medicine and public health, the Executive Council of the Association of American Medical Colleges has appointed the following committee: Dr. Harry S. Mustard, New York University; Dr. John E. Gordon, Harvard University; Dr. Charles E. Smith, Stanford University."

Not long after the appointment of the Committee, Dr. Gordon went to London to serve with the Harvard Red Cross Public Health Unit, and it was possible for him to participate in the Committee's deliberations only in their early stages. In view of this, and because of certain independent research which Dr. Hugh Leavell, Professor of Public Health, School of Medicine, University of Louisville, has recently completed in the field of teaching of preventive medicine and public health in medical schools, Dr. Leavell was made a member of the Committee in 1940. Dr. Jean A. Curran, Dean, Long Island Medical College, was added in 1941.

The Committee was not authorized to incur expenses for visits to medical schools, or committee meetings, and it has, therefore, been necessary to proceed slowly and to some extent indirectly. Its activities and approach may be summarized as follows:

After preliminary conference of the Committee members, there were sent to all American medical colleges, inquiries designed to obtain factual information as to organization, facilities and courses offered in preventive medicine and public health. As supplementary to information so received, or in lieu of it, when a given medical school failed to reply to the inquiry, the catalogues of all medical schools were studied rather intensively. When and as the opportunity arose, members of the Committee visited, somewhat informally and unofficially, a number of medical schools, thus obtaining certain first hand information. Whenever practicable, members of the Committee conferred with those engaged in the teaching of preventive medicine and public health in medical schools. The Chairman of the Committee has conferred with the Chairman of the Committee on Professional Education of the American Public Health Association, appeared before that Committee as a whole in the Spring of 1942, and has conferred a number of times with the Chairman of the American Public Health Association's Subcommittee on Education of Undergraduates in Preventive Medicine.

* Presented at the Fifty-fifth Annual Meeting of the Association of American Medical Colleges, held in Detroit, October 23-25, 1944. This report was accepted and approved for publication in the Executive Session.

At the 1941 meeting of the Association of American Medical Colleges, the Committee submitted a preliminary report which was approved by the Executive Council of the Association and was published in the March, 1942, issue of the JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

In the early summer of 1942, the Committee attempted systematically, by correspondence, to obtain from professors of preventive medicine and public health opinions on certain important points and moot questions relating to the subject, and in 1942 submitted to the Association an Interim Report (not published).

The Chairman of the American Public Health Association's Subcommittee on Education of Undergraduates in Preventive Medicine, and the Chairman of this Committee, after a series of conferences in 1944, developed a tentative draft for a final report and submitted it to their respective committee members. This final draft incorporates or reconciles suggestions made and has been submitted to the Committee on Professional Education of the American Public Health Association by the appropriate Chairman of that Association's Subcommittee.

FINDINGS AND CONCLUSIONS AS TO THE PRESENT STATUS OF TEACHING PREVENTIVE MEDICINE AND PUBLIC HEALTH TO MEDICAL STUDENTS IN AMERICAN MEDICAL COLLEGES

The findings and conclusions, set forth below, rest on three principal sources of material: (1) replies received to inquiries sent by the Committee to medical colleges; (2) previous studies, reports and papers on the subject under discussion; and (3) information possessed and opinions held by individual members of the Committee and others.

1. Although the course in preventive medicine and public health as given in one medical school resembles in its major characteristics that given in another, there exists quite a diversity of opinion as to how such a course should be given and by whom. Some of the disagreement is to be expected and encouraged, but no small part of it seems to arise from the following causes:

(a) Some use the terms "preventive medicine" and "public health" synonymously; others do not. This has contributed to unsatisfactory discussions and to disagreements more often apparent than real.

(b) Naturally, there is a tendency on the part of deans and professors responsible for, or especially interested in one particular aspect of a course in preventive medicine and public health, to defend the inclusiveness and exclusiveness of the content and arrangement of that course. If one does not teach, say, parasitology, as a part of preventive medicine and public health, then it is not essential; if one does provide this as part of the course, then he is inclined to consider it an essential part.

(c) Compared to other subjects taught in a medical college, the attempt to provide a course in preventive medicine and public health is a new undertaking. Facing an already overcrowded and not entirely elastic curriculum, proponents

of preventive medicine and public health have been forced to insinuate these subjects into the teaching schedule in an opportunistic rather than a systematic manner. This, naturally, has resulted in more divergence in the character of courses than seems desirable, and has not contributed to systematic instruction of good quality.

(d) Necessities and opportunities in the various medical schools, and in their respective adjacent facilities, have, to no small extent, shaped the patterns of courses in this subject. Of definite influence have been such factors as local health problems incident to geography; auxiliary facilities of nearby health agencies; the availability and teaching competence of health workers in the community, the number of students, the attitude of the medical school faculty and financial considerations.

2. Not through questionnaires, but on the basis of impression and experience, the Committee believes that although most deans and faculties of medical schools profess to consider it essential to provide sound instruction in preventive medicine and public health, many of them do not actually regard these subjects as important. The Committee's belief is, to some extent, substantiated by the fact that in the volume, Medical Education in the United States,[1] where there is a pattern map for evaluation of two contrasting schools of medicine, there is no reference to preventive medicine and public health.

3. From a study of the time of day, and the days of the week assigned for the teaching of preventive medicine and public health in the various medical college schedules, it would seem justifiable to believe that in many instances, the hours provided are those which no one else particularly wants. Noon hours and late afternoon periods seem particularly to fall to the lot of preventive medicine and public health, and a thirty-odd hour course is quite likely to be made up of one hour a week sessions spread over the entire year.

4. Without going into detail, it may be said that the general tendency in the past has been to provide instruction in preventive medicine and public health only in the last two years of medical education, and in many instances only in the last year. Recently, there has been an inclination to begin this instruction in the second year, occasionally in the first, continuing systematically throughout the four years of medical education.

5. There is much variation in the number of hours assigned to the teaching of this subject. A few schools provide no instruction at all in preventive medicine and public health as such, while a few others provide more than 200 hours. The median number of clock hours is about eighty-two.[2] Compared to the total number of hours available in the whole medical school curriculum, this represents 1.9 per cent as against 4 per cent advocated by the Association of American Medical Colleges and the American Medical Association. Few medical schools reach this recommended goal.

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1. Medical Education in the United States, 1934-39: Council on Medical Education and Hospitals of the American Medical Association, Chicago, The American Medical Association, 1940, p. 226.
2. Leavell, H. R.: Teaching Preventive Medicine to Medical Students, New York, The Commonwealth Fund, 1941.

6. A common experience of teachers of preventive medicine and public health is to find that the interest of third and fourth year medical students is at a minimum unless they have had previous instruction in these subjects. The reasons for this appear to be somewhat as follows: The student has by this time focused his interest, quite exclusively, on the pathology, diagnosis and treatment of the frankly sick individual. Having had no basic courses which lead up to preventive medicine and public health, as the preclinical subjects lead up to the clinical, he is inclined to regard this new instruction, dealing with prevention and the mass phenomena of disease, as something foreign to medical education and his future profession. Further, when instruction is begun in the last part of the four year course, it is likely to be superficial and didactic.

7. Methods of instruction vary considerably in the different schools. In the past there was a strong tendency to dispose of the matter by the provision of a series of lectures, though many schools have instituted clinics, seminars and some sort of field instruction where groups of students visit bureaus of the health department, sewage and water plants, pasteurizing plants, industries, etc. An increasing number of medical schools are effecting cooperative relationships with local health departments and voluntary agencies and, through this arrangement, provide observation, occasionally participation, on a modified clerkship basis.

8. Titles of courses offered in the 78 four year medical schools of the United States and Canada have a wide range, but the subject matter may be classified under broad headings as follows:[3]

(a) Preventive Medicine (in relation to work of private practitioner): 64 schools, 82%.

(b) Public Health Administration: 57 schools, 73%.

(c) Sanitary Science (environmental sanitation): 52 schools, 67%.

(d) Epidemiology: 53 schools, 68%, provide courses which appear to come under this category.

(e) Biostatistics: 43 schools, 55%; but courses vary widely in content, hours and character of instruction.

(f) Field work (modified clinical clerkships): 13 schools, 17%.

(g) Economic and sociologic aspects of disease and health: 33 schools, 42%. There is some reason to believe that this figure reflects the current situation over-conservatively.

(h) Field work (visits to health departments, etc.): 41 schools, 53%.

(i) Other activities: Non-classifiable situations in which courses ordinarily carried by some other department are included in the teaching program of preventive medicine and public health, or where the interest of an instructor, forward-looking perhaps, or possibly askew, has brought into the teaching program emphasis and development along unusual lines.

9. Among the 78 four year medical schools of the United States and Canada,

3. There are doubtless some inaccuracies in these data, as the situation is not static and in certain instances arbitrary decisions had to be made in classifying. The figures, however, are sufficiently close to the true picture to reflect it.

the organization for providing instruction in preventive medicine and public health falls into four categories, as follows: Separate department, full time head: 37, or 47 per cent; combined departments: 25, or 32 per cent; separate department, part time head: 9, or 12 per cent; other arrangements: 5, or 6 per cent; no information: 2, or 3 per cent. See Table 1.

TABLE 1.—CLASSIFICATION OF MEDICAL SCHOOLS BY ARRANGEMENT OF FACILITIES FOR TEACHING PREVENTIVE MEDICINE AND PUBLIC HEALTH, 1944. (1)

I

Separate Department Full Time Head

Baylor University
California, University of
Cincinnati, University of
Columbia University, College of Physicians and Surgeons
Cornell University
Harvard Medical School
Iowa, State University of
Johns Hopkins University
Long Island College of Medicine
Louisiana State University
Meharry Medical College
Michigan, University of
Minnesota, University of
New York Medical College
New York University
Oklahoma, University of
Oregon, University of
Pittsburgh, University of
Stanford University
Syracuse University
Temple University
Tennessee, University of
Texas, University of
Tufts College Medical School
Tulane University of Louisiana
Utah, University of
Vanderbilt University
Virginia, Medical College of
Washington University
Women's Medical College of Pennsylvania
Yale University
Dalhousie University
McGill University
Montreal, University of
Queens University
Toronto, University of
Western Ontario, University of

II

Separate Department Part Time Head

Buffalo, University of
Kansas, University of
Loyola University
Medical Evangelists, College of
Pennsylvania, University of
Southern California, University of
Wayne University
Laval University
Manitoba, University of

III

Combined with Some Other Department (2)

Albany Medical College
Arkansas, University of
Boston University
Colorado, University of
Creighton University
Georgia, University of
George Washington University
Georgetown University
Hahnemann Medical College
Howard, University of
Illinois, University of
Indiana University
Jefferson Medical College of Philadelphia
Louisville, University of
Marquette University
Maryland, University of
Nebraska, University of
Northwestern University
South Carolina, Medical College of the State of
Southwestern Medical College
Vermont, University of
Virginia, University of
Western Reserve University
Wisconsin, University of
Alberta, University of

IV

Other Arrangement

Chicago, University of
Duke University
Emory University
Ohio State University
Rochester, University of

No Reply

Bowman-Gray School of Medicine
St. Louis University

Summary

Separate Department, Full Time Head	37
Separate Department, Part Time Head	9
Combined with another Department	25
Other Arrangement	5
Committee received no reply to inquiry	2
Total letters sent	78

(1) In evaluating and interpreting data, the same criteria utilized by the Fitzgerald-Smith Study of 1935-36 have been observed. Dr. C. E. Smith, a member of that Committee and of this one, has reviewed the present data.

(2) The term "combined" is to some extent misleading. In about half these schools whose names appear in this column, the words "Preventive Medicine" and, or, "Public Health" appear in the title of the department concerned. In the other instances, teaching of Preventive Medicine and Public Health is a sub-function of a department carrying a title that indicates it to be designed primarily for some other purpose.

10. It is in those medical schools which provide a separate department for teaching and research in preventive medicine and public health, and where the

department head and most of his assistants are on a full time basis, that the Committee finds those courses which most nearly approach the curriculum content presented later in this report, and which reflect to the greatest extent the teaching methods mentioned in this report as desirable. While a few departments under part time heads are performing fairly creditably in the teaching aspects of the program, the preoccupation of the part time head with some other major activity does not build to a situation in which research may be fostered, or one where it seems likely that there will be effected, with other departments, that coordination of activities which is so highly essential.

11. From opinion expressed by many professors of preventive medicine and public health, and on the basis of its own conclusion, the Committee believes that the present (general) lack of clinic and hospital affiliations of those in departments of preventive medicine and public health is unwise and disadvantageous. A similarly unsatisfactory situation exists in relation to material used in teaching and research.

12. There exist tendencies toward two extremes in the teaching of preventive medicine and public health. In one group of instructors, particularly those with a long experience as health officers, it would appear that students are visualized as future health officers rather than as practitioners of medicine, and instruction is specialized and postgraduate in character. In the other group, usually those with a clinical background, instructors appear to be quite unconscious that students will, within a few years, practice medicine in rather a highly complex society. They seemingly fail to take into consideration the fact that economic and social conditions and even governmental policies not only affect health and disease, but determine to no small extent the circumstances and environment in which the physician must practice.

13. Among schools of medicine the median annual amount available for teaching preventive medicine and public health was found to be approximately $5,700.[4] When this median figure ($5,700) is placed against $167,485, which was reported[5] in 1940 as the median of the total annual costs of instruction in 64 medical schools, it is found that the cost of teaching preventive medicine and public health represents 3.4 per cent of total costs. For obvious reasons, such figures must be accepted with caution.

COMMENTS

THE TERMS "PREVENTIVE MEDICINE" AND "PUBLIC HEALTH."—The Committee would call attention to the fact that throughout this report it has considered the two terms "preventive medicine" and "public health" as overlapping to some extent but not synonymous. It believes that a general recognition of the fact that these are not synonymous terms would be a distinct contribution to clear thinking and preciseness of expression.

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4. LEAVELL, H. R.: Teaching Preventive Medicine to Medical Students, New York. The Commonwealth Fund, 1941.

5. Medical Education in the United States, 1934-1939: Council on Medical Education and Hospitals of the American Medical Association, Chicago. The American Medical Association, 1940, p. 113.

ELASTICITY IN TEACHING PROGRAM.—In formulating its recommendations, the Committee has attempted to provide certain baselines. It has, at the same time, been equally concerned with avoiding rigidity. It does not believe that a detailed uniform schedule as to content of courses, sequence of instruction or budget is desirable or practicable in all medical schools of the United States and Canada. It recognizes that the work of a department of preventive medicine and public health in one school will vary from that in another, just as is the case with departments of medicine, surgery, or pathology in the several schools. Thus, in one department of preventive medicine and public health, the program may generally be strong, in another generally weak. Again, one department of preventive medicine and public health, as an outgrowth of interest and resources, will develop strong courses in biostatistics, or epidemiology; another, while presenting fairly good courses in these subjects, will perhaps concentrate more upon preventive medicine in relation to the work of the physician in clinical practice. The Committee believes that these differences are healthy and are to be encouraged, so long as, on the whole, the teaching program contains a sound core of basic instruction, brings about in students an appreciation of the possibilities for maintenance of health, and provides an understanding of health and disease as a community or mass phenomenon.

PERSONALITY AND SCHOLARSHIP IN TEACHERS.—The Committee would like to emphasize that in undergraduate instruction in preventive medicine and public health, there are many goals and desiderata which cannot be covered by recommendations or standards. Reference here is made to such intangibles as personality, leadership, cultural background and the scholarly and scientific attitude desirable in those who are to be made responsible for teaching in this field. If a department head and some of his assistants possess these attributes, then a paucity in hours of teaching-time would be to some extent overcome; lacking most of these qualities, results attained would be mediocre even though an abundance of teaching hours were available.

IMPORTANCE OF RESEARCH.—Although this Committee was commissioned only as to the teaching aspects of this subject, and has therefore made no specific recommendations as to provision of research facilities in a department of preventive medicine and public health, it nevertheless seems pertinent to emphasize that in this, as in any university department, dry rot is likely to develop unless there is scientific curiosity and time and facilities for research.

INCREASING INTEREST IN THE IMPORTANCE OF PUBLIC HEALTH.—The Committee believes it not inappropriate to call attention to the fact that, regardless of extremes of radical and conservative opinion as to how the future of medicine may best be shaped, it seems likely that the demands of an enlarging public medical service under one arrangement or another, will in the future draw a greater proportion of physicians than heretofore into government employment, on full time, or part time basis, thus making them increasingly responsible for participating in organized programs, including corrective measures, in the interest of the public health. It would seem wise, in the circumstances, to familiar-

ize students with these trends. Important, too, is the further fact that in addition to the biologic factors which are responsible for disease, the problems and practices of public health are to no small extent determined by an interplay of social, economic and, in the broad sense, political forces. An appreciation of these factors in their interrelations with health and disease is, therefore, an essential part of a medical education.

DEPARTMENT OF PREVENTIVE MEDICINE AND PUBLIC HEALTH.—Medical educators agree that there is too much departmentalization in medical teaching. Under the pressure of accumulating knowledge, refinement of techniques, and of new and specialized skills in diagnosis and treatment, the old established departments of medicine and surgery have an already numerous progeny of small departmental units. Faculties of schools of medicine are, therefore, loath to expand the number of departments. In spite of this, the number of departments of preventive medicine and public health with a full time head, has increased considerably in the past decade. In most of those schools that do not provide a separate department under a full time head, certain deterrents are operative: Lack of funds, rationalization of an existing arrangement, or a belief that a desirable program of teaching preventive medicine and public health may be achieved, without a separate department, by integrating these subjects into the teaching schedules of the various medical science and clinical departments. In some instances it is difficult to determine which of these factors is in strongest operation.

The Committee has given careful thought to the argument that best results may be achieved by entire reliance on the already existing departments. It is an intriguing thesis, buttressed by some logic; and the Committee observes with gratification that in certain medical schools, the departments of pediatrics, and to some extent departments of obstetrics, are making valuable contributions to preventive medicine. No such contributions have been found in the teaching of public health and the extent of this field beyond clinical medicine makes it unlikely that they will be forthcoming.

The Committee's conviction that a separate department is necessary for sound and adequate instruction in preventive medicine and public health (presented below as a recommendation) does not, however, arise as is ordinarily the case, because new techniques and expertness have been developed in a special phase of some parent subject. Here a quite different principle is involved. A separate department of preventive medicine and public health is justified in medical teaching because preventive medicine introduces a new and, if not revolutionary, at least heretofore neglected, point of view: A primary interest in the conservation of health through prevention, rather than in the diagnosis and therapy of established pathology; and in the case of public health, introduces not only a new point of view, but subject matter that is not within the scope of clinical departments. In the latter departments each member of the teaching staff is properly and naturally interested in the individual as a unit; pathology is studied in the individual. The internist treats the patient; the surgeon operates upon a person. The department of preventive medicine and public health, how-

ever, is not interested primarily in the individual. It is interested in him as a part of a family, and is particularly concerned in the next larger unit of society, the community, of which the individual and family form a part. Thus, in interdepartmental conferences wherein might be discussed such subjects as tuberculosis, cancer, syphilis, diabetes, aftertreatment of poliomyelitis, various types of mental diseases, etc., the interest of the clinician is focused upon the course of the illness in the particular person under scrutiny. The teacher of preventive medicine and public health represents an entirely different point of view. He is concerned with what the patient and his illness represents in terms of the community. He is interested in the influence of social and economic factors, the heredity and environment that may have been instrumental in production of the illness in this person and in others in the community, and in how this particular kind of illness might, in the future, be prevented or decreased. To him the epidemiological record is what the bedside chart is to the clinician. These two viewpoints are not opposed, but complement each other in proportion to how clearly and completely the subject is studied.

The Committee, therefore, while strongly of the opinion that the teaching of preventive medicine and public health should be closely correlated with clinical teaching, can see nothing less than inadequate and unsatisfactory instruction in preventive medicine and public health in the absence of a department having primary interest in, and final responsibility for, teaching in these fields.

SUGGESTED CURRICULUM CONTENT.—On a number of occasions, members of the Committee have been urged by those responsible for teaching preventive medicine and public health to include in this report a suggested curriculum outline and course content. This the Committee has been reluctant to do, fearing that it might dampen initiative and begin a trend toward an imposed uniformity.

BASIC INSTRUCTION AND ADDITIONAL COURSES.—Some uniformity, however, has already been achieved, voluntarily and spontaneously in that there is a core of subject matter that teachers of preventive medicine and public health generally agree should be included in every sound course. Such disagreement as exists is to be found in regard to the exclusiveness and inclusiveness of the course as a whole, and as to how far one should go in providing detailed instruction in special aspects of the various subjects that make up the course: whether or not there should be separate courses in such subjects as public health administration, industrial hygiene, for instance.

In the circumstances, the Committee believes that there is need for some statement as to curriculum, and has, therefore, prepared a suggested curriculum, which is attached as a part of its recommendations. It has designated the courses which appear to it to be of fundamental importance, as *Basic Instruction,* providing the term *Additional Courses* for those subjects which the interests and convictions of a given teacher impel him to provide. As a safeguard against emphasis of these additional courses at the too great expense of basic instruction, the Committee offers Recommendation 3, below.

FELLOWSHIPS FOR PROSPECTIVE TEACHERS.—The Committee has given considerable thought to the problem of preparing teachers of preventive medicine

and public health in medical schools. The following comments seem pertinent in this connection: Conventional graduate courses in public health provide an important, but not a complete, background for those who contemplate teaching preventive medicine and public health as part of the curriculum. Active experience in public health work over a considerable period of time also provides excellent training for the teacher of these subjects. However, experience in administrative health work alone does not provide all the background that is required in a good teacher; and it should be obvious that competence in the teaching of preventive medicine and public health will not be acquired through postgraduate training and experience received solely in some other medical field. Further, it is of some importance to recognize that qualifications for and expertness in the teaching of preventive medicine and public health will not necessarily arise as part of the aging process.

At the present time there are few medical men who have had the opportunity to acquire training and experience in both the theoretical and practical aspects of this relatively new field of teaching. There is, therefore, a dearth of potential teachers of preventive medicine and public health. In this connection the Committee believes it pertinent to emphasize that this situation is not likely to be remedied in the absence of a carefully planned and continuingly operated recruitment system. Deans, medical faculties, foundations, and those at present responsible for teaching preventive medicine and public health must look well ahead as to needs for replacements and the filling of new positions, and plan accordingly. It would seem important to consider the following in any recruitment system adopted: (1) Young physicians, with sound medical and hospital training, and who possess initiative, imagination and poise, will not be interested in preventive medicine and public health unless this career is in fact a desirable one and is recognized as such. (2) Postgraduate education, training and experience must be of such a character as to provide the developing teacher of preventive medicine and public health an alternative career in the event that he is not chosen for continued grooming or promotion. To meet this necessity, young teachers or prospective teachers of preventive medicine and public health should have wide experiences and duties, not only within those fields, but in closely related subjects in the medical school and in clinics and hospitals. (3) It is quite necessary that there be continuing supervision of those in process of recruitment and training, to the end that the most may be made of the opportunity to shape good material. Such supervision must also make possible the early recognition of those who lack personal qualities, not acquirable by training and experience.

RECOMMENDATIONS

The Committee Recommends:

1. That the objective in each medical school be to provide a separate department of preventive medicine and public health, and that for purposes of evaluating the organization for teaching preventive medicine and public health in any given school, the combination of preventive medicine and public health with some other department be regarded as unsatisfactory after July 1, 1948.

2. That the objectives in each medical school be to provide a full time head for the department of preventive medicine and public health, and that for purposes of evaluating adequacy of direction of such a department, the part time head be regarded as unsatisfactory after July 1, 1948.

3. That there be set aside for the teaching schedule of the department of preventive medicine and public health, four per cent of the total hours available in the curriculum of undergraduate medical education, and that after July 1, 1948, any medical school providing less than this amount be considered deficient in this regard; that in calculating the total teaching time of a department of preventive medicine and public health, credit for courses outside the recommended content of Basic Instruction as described below, be no greater than one per cent of total hours available in the curriculum of undergraduate medical education, regardless of the fact that a greater number of hours than one per cent is actually devoted to teaching such subjects.

4. That the teaching schedule of the department of preventive medicine and public health become operative preferably in the first year of the curriculum, and not later than the second, and continue each year thereafter, and that after July 1, 1948, those medical schools that begin instruction later than the second year be considered deficient in this regard.

5. That the various departments of the medical school, in their respective fields, strive for the greatest practicable contribution in teaching the preventive aspects of disease; that in the highest degree possible, the teaching of preventive medicine and public health be integrated with clinical teaching, and that the greater part of the instructional staff in the department of preventive medicine and public health be given hospital and clinic appointments.

6. That, for salaries and other expenses of the department of preventive medicine and public health, there be set aside from 5 to 8 per cent of the budget of the medical school.

7. That the Association of American Medical Colleges go on record as favoring the creation, by one or more foundations, of fellowships in preventive medicine and public health, somewhat of the nature of the William H. Welch Fellowships in Internal Medicine, and designed to develop a continuingly available group of young physicians, competent in the future to assume responsibility in research and teaching in preventive medicine and public health.

SUGGESTED CURRICULUM

Basic Instruction Recommended as Desirable in the Teaching Schedule of Departments of Preventive Medicine and Public Health.

The Committee would like to reiterate its previously expressed conviction that the teaching of preventive medicine and public health should not be established in a rigid pattern. Elasticity and individuality must not only be permitted but encouraged. Yet it seems unlikely that sound progress will be made unless on the one hand there is brought into relief what seems a sensible core of instruction, and unless on the other hand, there is set forth the extent to

which one might exercise his individual predilections and ingenuity, and yet hold his teaching schedule within the limits of the subjects under consideration.

Recommendations as to distribution of teaching hours among the several subjects suggested below as Basic Instruction have been avoided deliberately, nor is there recommended any ratio between lectures, clinics, seminars, field instruction and clerkships. These are matters that experiment and the genius of a department head will derive more soundly than would Association fiat. The Committee would emphasize, however, that good teaching is not likely to evolve from one hour lecture periods; that a number of hours per week for a quarter or trimester, is preferable to a few hours per month for the entire year.

The various subjects suggested under Basic Instruction are, of necessity, placed in separate paragraphs. This does not imply a suggestion that there be similar separation in teaching. Different combinations and sequences, and varying coordinations of teaching methods are to be encouraged. It is with these things in mind that the following curriculum content is recommended:

It is desirable that instruction in preventive medicine and public health provide an introduction to the principles of statistics, with emphasis upon the necessity of accuracy in observation and recording of data, on exactness in establishing segregations and categories, on comparability of groups and of controls, on rates and ratios, on means, medians, measures of variation; and on the various phases of probability, such as the inaccuracy of conclusions from limited numbers of observations.

The material used might well include data relating to population, morbidity, mortality, physiology, anatomy, chemistry, hospital records, laboratory and research findings, papers in medical journals, health department reports.

The Committee would like to emphasize that biostatistics should be presented as a tool and a discipline, not as a self-sufficient and isolated subject. Instruction in biostatistics might, as a matter of fact, be provided by any department of a medical school. Its emphasis in the teaching of preventive medicine and public health seems due to an early recognition of its importance by workers in that field rather than because the application of biostatistics is peculiar to preventive medicine and public health. There seems no reason why it may not be combined with the teaching of epidemiology or other phases of a course in preventive medicine and public health, provided the combination is effected for purposes of improvement of teaching and not as a means of dealing summarily with an important element in the curriculum.

The Committee considers it highly important that instruction in preventive medicine and public health ensure in the medical students an understanding of the natural history of disease and a concept of disease as a mass problem. To achieve these goals the curriculum should include consideration of noncommunicable as well as communicable diseases, chronic as well as acute, endemic as well as epidemic diseases; and due attention should be given to the application of control measures as well as to an objective analysis of causation and transmission. Consideration of factors that determine varying prevalences should

include social and economic influences. Instruction along these lines should utilize and build upon a previously acquired or currently accumulating knowledge of bacteriology, immunology, and biostatistics.

It is essential that the student be generally informed as to the environment in which man lives; biological, physical, economic, social. Instruction designed to achieve this orientation should be introductory in character, and for the purposes of establishing general principles rather than expertness. Consideration should be given to sanitation, including those problems that arise from communal life and those facilities provided by communities to promote the health of its citizens. In general, but not on a postgraduate level, instruction should cover problems and control methods in water supplies, excreta disposal, milk and other foods, shellfish, insects; health in industry, peculiar occupational hazards, their recognition and correction; the general and specific relationship of social environment on community and individual health; housing in relation to public health; the correlation of morbidity and mortality with low income; the changing picture of illness and death by season; population pressures and changes in population constitution; the social order, its effect upon public health and practices, and its influence on the practice of medicine; an analysis of various schemes proposed for public medical service, an exposition of those already in effect in a given community.

Collateral to subject matter already suggested, and as an essential for the future practitioner of medicine, it is important to ensure, in the medical student, possession of that body of knowledge and of those skills believed to contribute to the maintenance of health and the prevention of disease in the individual and family; and further to ensure in him a consciousness of responsibilities and opportunities for the exercise of this knowledge and skill for the benefit of his future patients, public and private. Instruction in these aspects of preventive medicine and public health must be built upon the student's previous knowledge of physiology, in its broadest sense; upon his knowledge of the etiology and pathogenesis of disease; upon a sound understanding of the processes of infection and immunity; upon a recognition of the limitations as well as the potentialities of personal hygiene. The student must be stimulated by problems which lead to a consideration of the health status of the individual's family; how the racial, hereditary, cultural, educational, social, economic, and psychological background of that family may have played a part in the mental or physical health of the individual, and the possible operation of those factors in the present and in the future. Similarly, instruction should bring about, in the future practitioner, a sense of responsibility in relation to the family of his patient, and to the community. He must be made to realize that of all persons he, as a physician, is the one who has the greatest opportunity to teach health to his own patients and patients' families, and that this is an inherent responsibility of the physician in practice. Further, that those engaged in community health education, and the work they accomplish, are worthy of respect, being expert in their own professional field of community organizations, public relations and publicity, and that their work in no way competes with or encroaches upon the person-

to-person health instruction that the physician should provide as a routine in the practice of medicine.

To make effective his interest in community health matters, this future physician must know of available community resources; general and special services in the medical, hospital, social fields; and as a practitioner, he must be informed as to his legal obligations to the official public health agencies, as to the facilities these public health agencies offer, and of the way in which these obligations must be discharged, and how facilities may be utilized. This type of instruction should, preferably, begin at the bedside of the patient and in the clinic. The home situation of patients under observation in the hospital should be studied at first hand by the student and this information should be incorporated in the records and given consideration in the current and future care of the patient.

From observation and experience, the Committee is convinced that the learning and experience to which this course should lead may not be achieved by listening to lectures. Seminars, student presentation of cases and situations, and field observations, have in the past proven more productive.

Additional Courses That Might Be Offered by a Department of Preventive Medicine and Public Health Under Limitations Imposed by Recommendation 3.

These, in general, will consist of extension of certain aspects of subjects touched upon by courses recommended under Basic Instruction. Included among them would be such courses as industrial hygiene, sanitation, parasitology, public health administration, and other related subjects. There seems no reason why, with students or instructors particularly interested, other electives may not be offered. In offering electives, however, the instructional staff might well consider the danger of too much special instruction before assurance of general knowledge and orientation; and of subject matter more suitable for graduate than for undergraduate instruction.

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Fourth Report of the Committee on the Teaching of Tropical Medicine in Medical Schools*

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Three previous reports of this Committee since its appointment in 1941 have been published in the JOURNAL of the Association. The first report[1] called attention to the inadequacies of the teaching of parasitic and tropical diseases in most medical schools, and suggested the minimum instruction which should be given in these subjects. The second report[2] gave more detail with reference to the situation in the medical schools of the United States, made more specific recommendations with reference to subject matter and teaching personnel, and outlined a plan for providing special instruction and teaching material to instructors in medical schools. The third report[3] reviewed the program which was developed with the assistance of The John and Mary R. Markle Foundation for intramural and field experience for medical school instructors as it had been conducted through September, 1943. The present report gives a summary of this program through 1944 at which time it will practically be completed.

Each medical school in the United States and Canada has been given the opportunity to send instructors to attend an eight weeks' course in tropical medicine at the Army Medical School or Tulane University, and to spend one month in Central America gaining practical experience. At first each school was limited to two instructors, but as the value of the program was appreciated, other instructors were allowed to take advantage of it, and a few schools have had as many as four representatives.

The intramural course at Tulane was given three times during the first half of 1943. The intramural course at the Army Medical School has been given six times each year, and almost every session has been attended by one or more medical school instructors. A total of 39 instructors attended the Tulane course, and 68 will have attended the Army Medical School course by the end of 1944.

The Central American program during 1943 consisted of three weeks of observation at a United Fruit Company hospital, and one week with a Field Party of the Health and Sanitation Division of the Office of the Coordinator

* Read at the Fifty-fifth Annual Meeting of the Association of American Medical Colleges, held in Detroit, October 23-25, 1944.

of Inter-American Affairs. In January, 1944, this program was changed. The San Juan de Dios Hospital in San Jose, Costa Rica, had been found to have a wealth of clinical material covering a wide range of tropical diseases, and the Director, Dr. A. Pena Chavarria, an exceptionally well trained clinician, had offered to put his hospital at the disposal of this program. The program for 1944 has been as follows: Two weeks in San Jose, Costa Rica, observing clinical and pathological material at the San Juan de Dios Hospital, and visiting a leprosarium, a serpentarium, and Public Health installations under the guidance of the Office of the Coordinator of Inter-American Affairs. Some individuals also have had an opportunity to visit the United Fruit Company hospital at Limon. This period has been followed by assignment to a United Fruit Company hospital for one week. The hospitals used for this purpose have been those at Tela, Honduras, and Tiquisate and Quirigua, Guatemala. A few of the instructors who are pathologists have remained at the San Juan de Dios Hospital for three weeks in order to perform as many autopsies as possible. They have omitted the week at the United Fruit Company hospital. The entire group has gathered at Guatemala City for a final ten days at the Office of the Coordinator of Inter-American Affairs observing local Public Health and hospital facilities, and visiting typhus fever, onchocerciasis and malaria control activities in the field.

By the end of 1944, 98 instructors from medical schools will have participated in the Central American program. Of these, 69 will have also attended the intramural course either at Tulane or at the Army Medical School, while 29 will not have attended an intramural course. Most of the latter group, however, have had previous training in parasitology or tropical medicine.

A total of 135 medical school instructors have participated in the tropical medicine program of the Association. Of these, 37 have attended an intramural course only, 29 have had practical experience in Central America only, and 69 have obtained both intramural and practical experience. These instructors have come from 69 of the 87 approved medical schools in the United States and Canada. Of the 68 four-year schools in the United States, 57 have participated. Of the 9 two-year schools in the United States, 6 have participated. Of the 10 schools in Canada, 6 have participated. Table 1 shows the number of instructors participating from each school and the type of experience which they have obtained. It is very gratifying to the Committee that so many schools have taken advantage of the program. Undoubtedly a larger number of individuals would have participated if the teaching staffs of institutions had not been so greatly depleted by the war.

This program could not have been conducted without the financial support of The John and Mary R. Markle Foundation. The first appropriation of $25,000 for the intramural courses was made in December, 1942. Three subsequent appropriations totaling $19,228.17 were made for these courses. The total appropriations for these courses was, therefore, $44,228.17.

The first appropriation for the Central American program was made in

May, 1943, and amounted to $35,000.00. Three subsequent appropriations have been made totaling $35,462.60. This makes a total appropriation for the Central American program of $70,462.60.

The Markle Foundation also made an appropriation of $1,000.00 in December, 1942, to support the Distributing Center for teaching specimens in tropical medicine and parasitology established at the Army Medical School. From January 1, 1943, to September 30, 1944, 95,499 specimens were distributed by this Center.

A Contingent Fund of $309.23 has also been set aside by the Markle Foundation for use in either the intramural or Central American program, if necessary. This brings the total appropriations of the Markle Foundation to the Association of American Medical Colleges for improving the teaching of tropical medicine to a total of $116,000.00.

The Committee wishes at this point to express its appreciation to The John and Mary R. Markle Foundation, and particularly to the late Mr. Archie S. Woods who largely envisaged this program and supported it with the keenest enthusiasm. Although his tragic death in the midst of the program was keenly felt, the continued support of Mr. Vernon Monroe and Dr. John A. Ferrell have made the completion of the program possible. The Committee recommends that the Association send an official vote of thanks to the Markle Foundation for its valuable assistance.

The Committee, with the consent of the Markle Foundation, has invited Dr. A. Pena Chavarria, Director of the San Juan de Dios Hospital, San Jose, Costa Rica, to visit medical centers in the United States for a period of two months during the spring of 1945 in recognition of the service which he has rendered in this program. A fellowship stipend has been set aside from the appropriation for the Central American program to cover Dr. Pena's expenses for this visit. Dr. Pena will study particularly the advisability of establishing a school of medicine in Costa Rica.

The Committee does not contemplate the granting of fellowships for either intramural courses or for the Central American program during 1945. It is possible, however, that there may be a few exceptional cases in which it will seem advisable to grant such fellowships. The Committee recommends, therefore, that any surplus in these appropriations existing at the end of 1944, be retained by the treasurer of the Association through the year 1945 for use at the discretion of the Committee.

It is impossible to measure with any degree of accuracy the influence of the above programs on the teaching of tropical medicine in the medical schools of the United States and Canada. The excellence of the intramural courses has been repeatedly attested by those who have attended them. The experience gained in Central America has varied greatly with individuals, depending on their point of view, intelligence and ingenuity. There is no question that many of them have gained considerable value from the experience. Many of them have acquired teaching material including colored photographs, motion pictures, and

specimens of various kinds. The reports of six instructors on their experience in Central America have been published in the JOURNAL of the Association,[4] and elsewhere.[5] A few instructors made studies of particular subjects, such as McGavack and German on Sicklemia in the Carib Indian.[6] The degree to which the experience has been applied to teaching in medical schools has also varied considerably depending on the teaching responsibilities of the individuals, and the provision made for tropical medicine in the curriculum. It is known that many schools have increased considerably the time and equipment for this field of teaching.

An instructor from one medical school was granted a second fellowship to spend two months in Puerto Rico making blood studies in leprosy. Although it has not seemed feasible to grant other second fellowships, there have been several requests from those who have participated in the program. Most of these have been referred to other Foundations. The Committee feels that there will be an increasing demand for such fellowships, and recommends that the Association develop a plan for implementing the exchange of instructors and research workers between this country and Latin America.

In closing, the Committee wishes to express its appreciation to Dr. Fred C. Zapffe and Dr. A. C. Bachmeyer, secretary and treasurer of the Association respectively, for their cordial and prompt cooperation in handling the financial aspects of this program. The Committee also recommends that the Secretary of the Association be instructed to write an official letter of thanks to Colonel George R. Callender, M.C., AUS, Director of the Army Medical School, Army Medical Center, Washington, D. C., Major George W. Hunter III, Director of Distributing Center for Parasitological Specimens, Army Medical Center, Washington, D. C., Dr. Ernest Carroll Faust, Professor of Tropical Medicine, School of Medicine, Tulane University, Brigadier General George C. Dunham, Health and Sanitation Division, Office of the Coordinator of Inter-American Affairs, Commerce Department Building, Washington, D. C., Dr. Edward I. Salisbury, Director, Medical Department, United Fruit Company, Pier 3, North River, New York 6, N. Y., and Dr. A. Pena Chavarria, Director, San Juan de Dios Hospital, San Jose, Costa Rica.

Respectfully submitted,

(Signed) HIRAM W. KOSTMAYER
MALCOLM H. SOULE
HENRY E. MELENEY, Chairman

REFERENCES.

1. MELENEY, H. E., LAPHAM, M. E., SOULE, M. H.: The teaching of tropical and parasitic diseases in medical schools of the United States. *J. A. A. M. Coll.*, 17:117-122 (March) 1942.
2. MELENEY, H. E., LAPHAM, M. E., SOULE, M. H.: Report of committee on the teaching of tropical medicine in undergraduate medical schools of the United States. *J. A. A. M. Coll.*, 18:34-56 (Jan.) 1943.
3. MELENEY, H. E., SOULE, M. H., KOSTMAYER, H. W.: Tropical medicine fellowships of The John and Mary R. Markle Foundation. *J. A. A. M. Coll.*, 19:129-138 (May) 1944.
4. RUSSELL, W. O., WILSON, H. E., WOOLNER, L. B., JOHNSTONE, H. G., HAMMON, W. McD.: Reports on tropical medicine fellowships served in Central America. *J. A. A. M. Coll.* 19:257-271 (Sept.) 1944.
5. MCGAVACK, T. H.: Medicine on the mosquito coast. *Bull. N. Y. M. Coll.*, Flower and Fifth Ave. Hosp. 7:10-30 (April-June) 1944.
6. MCGAVACK, T. H., GERMAN, W. McK.: Sicklemia in the black Carib Indian. *A. J. M. Sci.* 208:350-355 (Sept.) 1944.

TABLE 1.—NUMBER OF SCHOOLS AND INSTRUCTORS PARTICIPATING IN TROPICAL MEDICINE PROGRAM
1943 and 1944

United States Schools	Number of Instructors				
	A. M. S. and C. A.	Tulane and C. A.	Intramural Course Only*	Central America Only	Total
1—University of Arkansas	1	0	0	0	1
2—University of California	2	0	0	0	2
3—College of Medical Evangelists	1	1	0	1	3
4—University of Southern California	0	0	A	0	1
5—Stanford University	0	0	A	0	1
6—University of Colorado	1	1	0	1	3
7—Yale University	2	1	0	0	3
8—Georgetown University	0	0	A	1	2
9—George Washington University	0	0	T	1	2
10—Howard University	0	0	0	0	0
11—Emory University	0	1	A	0	2
12—University of Georgia	1	1	0	1	3
13—Loyola University	0	0	0	0	0
14—Northwestern University	0	0	T	0	1
15—University of Chicago	1	0	0	0	1
16—University of Illinois	0	1	0	0	1
17—Indiana University	2	0	0	0	2
18—Iowa State University	1	0	A	1	3
19—University of Kansas	1	0	0	0	1
20—University of Louisville	0	0	T	0	1
21—Louisiana State University	1	0	0	2	3
22—Tulane University	0	0	0	0	0
23—Johns Hopkins University	0	0	0	0	0
24—University of Maryland	0	0	0	0	0
25—Boston University	1	0	A	2	4
26—Harvard University	0	0	0	0	0
27—Tufts College	0	0	2A	0	2
28—University of Michigan	2	1	0	0	3
29—Wayne University	0	0	2(A-T)	0	2
30—University of Minnesota	1	0	0	1	2
31—St. Louis University	0	0	2(A-T)	1	3
32—Washington University	1	1	0	1	3
33—Creighton University	0	0	2A	0	2
34—University of Nebraska	0	1	0	0	1
35—Albany Medical College	0	1	A	1	3
36—Long Island Medical College	0	0	0	2	2
37—University of Buffalo	2	1	0	1	4
38—Columbia University	1	1	0	0	2
39—Cornell University	1	1	0	0	2
40—New York Medical College	0	0	T	1	2
41—New York University	0	0	A	1	2
42—University of Rochester	1	0	0	1	2
43—Syracuse University	1	0	T	1	3
44—Bowman Gray School of Medicine	2	1	0	0	3
45—Duke University	1	1	A	0	3
46—University of Cincinnati	0	0	T	2	3
47—Western Reserve University	0	0	0	0	0
48—Ohio State University	1	0	0	0	1
49—University of Oklahoma	1	0	0	0	1
50—University of Oregon	1	1	0	0	2
51—Hahnemann Medical College	0	1	0	1	2
52—Jefferson Medical College	1	0	0	0	1
53—Temple University	0	0	0	0	0
54—University of Pennsylvania	0	0	0	0	0
55—Woman's Medical College of Pennsylvania	0	0	2(A-T)	0	2
56—University of Pittsburgh	1	0	0	0	1
57—University of South Carolina	1	0	0	1	2
58—University of Tennessee	1	0	T	1	3
59—Meharry Medical College	0	0	A	0	1

United States Schools	Number of Instructors A. M. S. and C. A.	Tulane and C. A.	Intramural Course Only*	Central America Only	Total
60—Vanderbilt University	0	0	0	1	1
61—Baylor University	0	0	A	0	1
62—Southwestern Medical College	1	0	0	0	1
63—University of Texas	2	0	0	1	3
64—University of Vermont	0	0	0	0	0
65—University of Virginia	1	0	T	0	2
66—Medical College of Virginia	0	1	0	0	1
67—University of Wisconsin	0	0	2(A-T)	1	3
68—Marquette University	0	0	0	0	0
Two-Year Schools					
69—University of Alabama	0	0	0	0	0
70—University of Mississippi	0	0	0	0	0
71—University of Missouri	1	0	0	0	1
72—Dartmouth Medical School	1	1	0	0	2
73—University of North Carolina	0	0	2(A-T)	0	2
74—University of North Dakota	0	1	0	0	1
75—University of South Dakota	0	0	T	0	1
76—University of Utah	0	0	T	0	1
77—University of West Virginia	0	0	0	0	0
Canadian Schools					
1—University of Alberta	2	1	0	0	3
2—University of Manitoba	0	0	0	0	0
3—Dalhousie University	1	0	0	0	1
4—Queen's University	1	0	0	0	1
5—University of Western Ontario	0	0	T	0	1
6—University of Toronto	0	1	A	0	2
7—McGill University	0	0	0	0	0
8—University of Montreal	0	0	0	0	0
9—Laval University	0	0	0	0	0
10—University of Saskatchewan (2-year school)	1	1	0	0	2
Grand Total (U. S. and Canadian Schools)	46	23	21A 16T	29	135

* A = Army Medical School. T = Tulane University.

Study of Human Anatomy

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Many comments upon courses, and on pedagogic technique, in bringing medical and dental students to a knowledge of human anatomy, chiefly as to dissection schedules, using a standard text, and by means of question, answer and discussion, have appeared in this JOURNAL.

First, we must remember, the student is required to prove his capacity, by examination and demonstration. Both intracollegiate tests, and Board examinations occur, followed by more examinations in applying for positions, as intern, resident, or attending relations to hospitals, and, again, in the societies which he may wish to join. These examinations frequently expose anatomy as forgotten or misunderstood. Anatomy is rarely complained about otherwise, although at the operating table it is clinical pathology which seems wanting.

It will occur to any one that these tests are not comprehensive, usually, but represent ten formal leads. In diagnosis, even the electrocardiogram has "check" leads, and a physical examination, as well as one by fluoroscope. The student of anatomy certainly deserves a general review. He has used compends, but will never carry in mind even a good digest of the material now obtainable in a standard text (2,000 pages).

What is this all about? Arriving in a dissecting-room, the student, we observe, never had, in preprofessional days, even glanced at a copy of Gray, Morris, Piersol or Cunningham. Nor does he anticipate the manner or method of such textual collaboration. He could have been forewarned; since these texts do not present material, lesson by lesson, but for each region, or structure, the related vessels, nerves, etc., appear one hundred pages apart. At night he fails to get this material organized.

Without having taken a "premedical" course, he could have observed the use of severe scientific terms, in Latin (mediad, proximad, and the various phrases: nervi vasorum, confluens sinuum, arteria comes nervi ischiadici; which, if not inherent to his thought, obstruct his thinking).

No student survey exists to expose just what the difficulties appear to be, to him, although anatomy teachers explain how his reactions affect them. He, and they, agree that he cannot remember. And some teachers say memory means little as a test. Others ask such questions as require memory. And teachers say the student fails to reason. But reasoning requires some memory of material. Why not allow anatomy texts to be brought into the examination room?

And, in parallel, if the student is certain to forget what he learns about the human body, why ask a preprofessional study of cat, or rabbit, which he will probably forget even more quickly? When the student does arrive in a medical school, after presumable dissection in some antecedent course, he buys a set of

dissecting instruments,—forceps, scalpel, probe and various other tools, which he evidently never possessed—how he opened the cat, rabbit, frog, or selachian, we discover, and that he has obtained scarcely any technique. He snipped it open with a scissors, looked into it, and placed it in a waste receptacle. This waste of good material continues, with a teacher doing part of the dissection of a first year medical student, to "save" the structures, and the student saying, "I can't find it; you find it for me." And what did the teacher want him to find? We, then, observe demonstrations of cross-sections advised, as the student has had no training in three dimensional conception.

Therefore: We shall either demand preprofessional dissection to be "checked up" on entrance, or not demand it. College grades do not indicate how much skill a student has gained. Or, we can give extra hours to obtain command of forceps and knife, subdividing the student curriculum. This necessity comes because the first year student must prepare material from which to study (relations, at first hand, etc.) In histology, he is given a set of 70 or more slides all ready, sectioned, mounted and stained. Now, if in embryology and in histology, he should have to cut, fix, mount and stain, before study, we would encounter the parallel that some students would have to study from imperfect specimens, as they do in the gross anatomy laboratory, where bronchial veins are lost by students (as George Seib complained at an Association of Anatomists meeting, at which Seib was describing the azygos system).

We are to deal, therefore, with a course based on badly prepared material, and given with its essential meanings in a foreign language (Latin).

With subdivision of the first year class, we can supplement the course in these directions, dexterity and English and Latin phraseologies needed to write an examination paper, since examiners do not, cannot, or will not examine directly on the human structures at a table (Tharaldsen's comment).

In preprofessional days, one might expect that the medically or dentally minded student would assemble a suitable "five-foot shelf of indicative writings," if not exactly texts in preprofessional course materials, at least in the line of direct intelligence, and even during first year studies in medicine this collection might occur to him. Harvey on the circulation, and of Willis on the brain, in Latin, are easy reading. Also, some copies of the *Anatomical Record*, with remarks on the azygos system; Kingsbury on the thyroid in marsupials; morphology of the vertebrae by Williston; papers on heart, vermiform appendix; Huntington on the peritoneum (1903) and Hertzler on the anatomy and the surgery of the peritoneum; McMurrich on the phylogeny of the forearm and the crural flexors. [We observe bank clerks reading books on economics, and salesmen, in train, or subway, carry appropriate reading matter.]

With freshmen medical students subdivided as suggested, the main course introduces its text: These texts are enlivened in two directions: Antecedently (morphology) for which the student could have obtained a copy of Orders

of Mammals by William King Gregory; and the primate implications, using Gregory's monograph on Notharctus, or Parker and Haswell.

The medical student should know that the primitive tetrapods establish the position for determining pre-axial and post-axial relations (this fact and others should not impede the main gross anatomy course, but be placed in group study, by subdivision, from time to time *pro re nata,* as emergency arises).

The texts enliven forwards (as to clinical implications) but we do not at this time include attendance on clinics in first year schedules, as was done in the University of Pennsylvania, 1895, daily at 8 a.m. Here the entering student saw swollen and edematous feet, and their correlated dissection exemplified worn cardiac valves, or differentiated the mass (tumor) in the head of the pancreas, pressing back against the inferior vena cava, with engorged tributaries of the cava considered. If the tumor were located in the neck of the pancreas, the portal vein was found obstructed, and ascites developed. He saw the relations, and was informed that in incurable disease one might detach a ureter and implant the lower portion within the peritoneum, so that the liquid would run out. The first year student grasped this, and memory was stimulated, more than by textbook notes that in carnivores the seminal bladder does not develop, and that the gallbladder is not existent in horses or deer.

When the first year student of anatomy passes to physiology courses, often also in the first year, he must find, section and stimulate the depressor nerve of the heart (in the left neck of the dog). (Why?) Or, the intercarotid nerve of De Castro to the carotid sinus. Or, the *nervus erigens.* The Bundle of His, A-V node and bundle, which he could find in the gross anatomy laboratory, and its blood and nerve supply, might have been examined in one lesson.

He may never have dissected the levator of the palate, the salpingopharyngeus (the latter, according to Strong, needed to explain movements of the pharynx, *Anatomical Record,* 1944). Here we find bad correlation in curricula.

Textbooks also badly represent the material, as to uncertain details. The nerves to the *Tensor palati,* and to the *Tensor tympani,* are given as branches of the otic ganglion in texts, but A. Brazier Howell says (p. 163) that the nerves are branches of the mandibular nerve, superior (proximad) to the otic ganglion. Cunningham (8th edition) agrees (1943).

How much of this variance among texts occurs every teacher knows and the time it consumes to explicate.

So, after regulating the amount and kind of dexterity, and of Latin, and of morphology, definitely in the morphologic details at least, and after supplementing wants along these lines and supplying brief extra-hour periods on terminology, which must mean that the student in first year anatomy just drops out of the laboratory if he exhibits any real hiatus in these forms of fundamental learning, goes to a First Aid station, is revived, injected with Stuart Mudd's plasma of knowledge, and tested, after which he may return, we perceive that a class A

course can be administered, rather speedily and effectively, if we disregard pre-professional courses, and require a graded amount to be superadded before too late; that is, during the first and second year in medicine.

Some of the questions administered must be reconditioned.

(a) Where will the member separate if a hand be caught in moving machinery? The examiner has decided that it will come apart at the shoulder, because he thinks this is weakest. The individual may have a very strong set of shoulder muscles.

(b) Name the three groups of muscles in the buttock. Fudge! This should read name and group the muscles within such and such an area.

(c) The student is given an outline across the pelvic level of the heads of the femora: To fill in details, say in 5 minutes. Query? How much and what previous training led up to this exercise?

Next: The student purchases a microscope, a stethoscope, a thermometer, a blood pressure apparatus. Why not require him to have a skeleton? This belongs near the five foot shelf, together with a good cast of and a separable model of the brain. The student should have, also, some comparative bones, young, with separate epiphyses, of calf and of sheep. He needs wet specimens of the chicken's intestinal tract (entire alimentary tract is best). Also some sheep hearts and brains.

William Dock vouchsafes the note that anatomy is a fourth year subject. What this amounts to is that the atmosphere of a dissecting room embraces all the courses, and adumbrates all the discussions.

How to keep the course within bounds? George Arthur Piersol wrote to me, in 1913, "Nothing perplexes a student more than a mass of details for which he is unprepared." Frank Lusk Babbott, Jr., said to me in 1930, "First things first." The first year anatomy student removes the skin, and is at once plunged into a discussion of metameres, or of preaxial and postaxial borders. (We should just send the unwitting student out of the room until he is adjusted to his environment, or he will split up, like Morgan's embryo, into a monstrous thing.)

Memory: We can give all the bloodvessels, naming each by the area or structure which it subserves, and finding its origin from any near vessel. All the muscles can be named by just beginning with the first encephalic nerve and down through all the spinal nerves, by number.

The few main areas can be oriented: Axilla, pericardium, peritoneum, cranial fossae. Observe that a muscle acts on each joint which it crosses. Ligaments are thickenings in planes of fasciae. Joints occur when two or more parts of the apparatus act in relation to a line or point called technically "fixed"; named: radionavicular, naviculolunate joint, moved by muscles placed so that they shorten the distances between certain points. Hilton's law elucidates nerve supplies of all joint areas, of related skin, and of muscles acting there. Scientific guessing

is followed by dictionary reference. "New" joints are "found" by the student (not stated in text).

In the Friends' Central School, 15th and Race streets, Philadelphia (1890), human anatomy and physiology were taught in courses to all students of 12 years, followed by chemistry of urine and of blood (simply), and by conversations in German, French, Latin (and Greek, as requested).

Alan Gregg mentions a comparison of youths of 18 years, elsewhere compared to those aged 20 in America. He is correct in suggesting that we need a means to "push" able students. No bright child (or adult) wants to sit through repeated explanations made to morons. In medical and dental first year classes we have at present sections for groups according to A to Z (last name). Why not for student groups in anatomy and in physiology and chemistry based not on the mischance of a name initial (like the Clef book of the Chinese language) but rationalized on the A-Z of intelligence, experience and mental frame of reference of the individual?

To this end, the present grand slaughter house of good material (the gross anatomy laboratory) must give way to a series of small dissecting rooms. Originated in the idea of plenty of light and air, the large hall has become a grand babble of conversation at high voice pitch.

In one college, due to the war, increase in student attendance, an extra, and small laboratory, has been annexed. One of the best teachers on the staff, who formerly opposed demonstrations made to groups of students, because of confusion, removing and talking, now is assigned to the small laboratory. Here he does diametrically what he opposed: He demonstrates, converses, and the students read sentences from the text, and discuss the material. Subdivision of the class has approached individualized teaching and learning.

The remaining problem is to standardize the required minimum of learning and explanation, and this should be rigidly tested for each student, orally and in writing, and let this required minimum be established sensibly. First things first: the structures, their morphology and development. Only after this stage should questions of the nature of application, such as surgical or therapeutic derivations be discussed. Curiosities of question, such as splanchnic ptosis or surgical approaches to regions, require the conference room.

ANCILLARY COMMENT

1. Subdivision of a first year medical class is reasonable, since we cannot standardize the individuals as to preprofessional background. We shall, then, be able to facilitate the thinking of each student in direct line, and it would become possible to combine all the groups for some class work.

2. If the preprofessional student could foresee his future, he might use his time to advantage, and some students do. During the first year of medicine, or of

dentistry, small study groups, as "elective" subjects, might regain opportunity, and a more consolidated class develop. Toward this, we find "reading" courses suggested in this JOURNAL (May 1944) valuable. And even dissection of human or of comparative material in extracurricular time is possible to achieve particular ends.

3. Dissection, from a general standpoint, as a course, should be supplemented strongly by demonstrations and by student dissection groups toward a correlation with anatomic needs in special fields. (a) For experimentation on cat, rabbit, macac. (b) It is common experience for the physiologist to discover that the student does not know the anatomy of the nerves to the parotid or the submandibular gland, nor of centers of the nervous system. And the "physiologic" heart is found to be not that of the dissecting room. Feces, or urine, human and comparative, never were seen. When a dog eats bone, a whitish material encrusts his dejecta. When a chicken eats bran, it shows at once. The fecal mass of a chicken has semisolid white material on it (avian urine). Human feces, and urine, as well as blood, are objective, material, and anatomic.

(b) Obstetrics, needed by the general practitioner, requires a good perineum, muscle, nerve, blood, fasciae and bone. The student learns how the puboprostatic bands really fix the male bladder. Ask him, or the usual text, for the fixation of the female urinary bladder.

Howard Kelly spent years in deciding that no sphincter fibres intervene between the female urethra and the vagina. Howard Kelly "did things nobody else, then, dared to do." One day an attending took his place at the operating table, the story goes, "And did he perform Kelly's operation?" "Like Kelly did!" was the answer.

Let me venture out on this dangerous line: (c) Teachers in medical subjects, not having a degree in medicine, try to enlighten the first year student on diagnosis, and suggest treatment, in the anatomic, physiologic, and chemical courses. If these teachers were to go to the clinic they would not be able, and certainly would have no right (mere technicians) to practice medicine or surgery. Even the standard texts of anatomy, written by able men (Ph.D., M.S., etc.), attempt to lead the early student along a path which they cannot themselves sustain. I wish that I dared to cite gross errors in our texts, and grossly erroneous relations (in figures) of anatomic regions, misstatements which no clinician would fail to see, masked in a comparative morphology.

(d) Gross variances of anatomic texts; confusing to any unprepared beginner, and affecting his mode of thought, in work or at examination, resulting in grades, due to type of question.

REPRINTING OF LABORATORY TEXTS: Notice, in Morris (1942, 10th ed., p. 1496) "The thyroid anlage is unpaired, and all claims as to the paired, lateral origin of the gland "have to be disregarded." (Why?) And in Cunningham (1943, 8th ed., p. 784) Appleton and Weller cited: the thyroid gland is developed

from a median ventral," etc., "and from two lateral primordia which are identified with the ultimobranchial bodies." The long disputed, etc., seems "to be settled in favor of this view." Also, as to fetal admixture of blood currents in the right atrium, from edition to edition (other texts) waver, back and forth in opinion. Standard texts for beginners, if first year students are to become just beginners, ought to handle a great many points in a distinct footnote. This would simplify, and justly abbreviate, the text to the main line of the course, and preparation for a student's test would be clarified.

Program: As Carl J. Wiggers advises in his physiology text, in anatomy the basis of the course should be generalized, and organized, around which the coordinates of details, and their variables would be grouped, with a definite minimum to be required, as to memory and explanation; this program to be accepted by all examiners. Extra credits could be allowed for extensions of detail.

When we re-read the "Teaching of Anatomy (*Anatomical Record,* June, 1918) by George S. Huntington and consider present ideals, we notice that the plane of the ecliptic is no longer oriented as it then had to be.

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1. Evans, Gertrude S.: Striate Body, Functions, etc. American Biology Teacher: Test for School Children. Five minutes in the Biology Classroom. (To appear) (1944).
2. Evans, Gertrude S.: Striate Body, Functions, etc. (a) *Anat. Rec.* (abstr.): 82; No. 3, p. 16, 1942. (b) *Anat. Rec.* (abstr.): 88; No. 4, p. 14, 1944.
3. Evans, Thomas H.: Skeletal Material in Teaching, American Biology Teacher: 6; No. 2, p. 35, Nov. 1943.

Dental Teaching Programs in Colleges of Medicine*

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The teaching of certain aspects of dentistry should be incorporated into the undergraduate medical curriculum, because physicians should be conversant with dental disease to the extent at least of being able to evaluate dental pathology in relation to systemic disturbances. The mouth is a part of the body and its ills may be reflected in remote places, as well as itself reflecting systemic disorders.

The dentist's exposure to the fundamentals of medicine begins as soon as he enters dental college, the first two years of his undergraduate professional study being largely taken up with the study of basic medical sciences. The association of dental and medical students in these studies is very close, in some instances the classes being conducted for both groups together. Externships, such as the one at the University of Nebraska College of Dentistry, are beginning to be offered in the undergraduate curriculum, in which the dental student does the same type of work as the medical extern; e. g., blood counts, urinalyses, writing histories and other aspects of the physical examination which are useful in determining the patient's general physical status.

The present study was undertaken to determine the amount and extent of the teaching of dental pathology and therapeutics in colleges of medicine.

METHODS AND MATERIALS

A search of the literature revealed one pertinent article, a discussion of the course in stomatology being offered at the University of Illinois.[1] Other articles,[2] whose titles were suggestive, were found not to be pertinent. Consequently, other sources of information had to be consulted.

A review of the bulletins of the medical colleges in the United States was made to determine what was included in them under the general heading of dentistry. It immediately became apparent that this search would not be easy, for in many instances the material was "concealed" in another department. For instance, one course was a continuation of the lectures in public health which was listed in the catalogue at Pathology 4b. In other instances, dentistry was mentioned only very briefly, as: "Oral surgery, included in surgical clerkship;" or "Surgical clerkship (4th year) . . . includes general, oral, neurocirculatory . . .," and again, under Hygiene and Preventive Medicine, "Problems of a community nature, including mental hygiene, dental hygiene and prophylaxis . . . are emphasized."

Out of a total of 62 bulletins, 26 mentioned dentistry in some way or another. Three of these schools obviously concentrated on postgraduate medical and dental education, and one listed principles of surgery for dental students.

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TABLE 1

No. of School	Time Spent	Content of Course	Hours	Remarks
1	1 period of 3 hrs.	Growth and Development Malocclusion. Periodontal diseases, focal infection. Oral hygiene and preventive Dentistry, oral lesions and manifestations of systemic disease.		Lecture, slides and presentation of patients.
2	10 hrs. (1 quarter)	Radiology Oral Surgery Periodontal Diseases, Oral Hygiene and Preventive Dentistry Orthodontia Restorative Dentistry	2 3 1 1 1	
3	15-18 hrs. (Seminar) Student in surgery assigned to dental clinic 2 or 3 half days a week for observation	Fundamentals of Occlusion Comparative dentitions Growth and Development Dystrophies of teeth Dental caries—including control, treatment, hygiene, diet. Pulp Diseases—Root canal treatment vs. extraction; periapical pathology, focal infection. Periodontal diseases Soft tissue diseases		Several extractions seen, consultations on problems involved in maintenance of oral hygiene. Root canal therapy under aseptic conditions.
4	6 hrs. No clinic Part of physical diagnosis in 2d year	Embryology, Growth and Development, Histology, Anatomy, Technique of Inspection of Mouth Dental caries through pulp involvement and sequelae (swelling of face) Osteomyelitis, Periodontal diseases (continuation of Lecture No. 2) Tumors Fractures of jaws and impactions Oral hygiene, preventive dentistry, medico-dental relations	1 1 1 1 1 1	Oral cavity part of body. Oral manifestations of systemic disease.
5	15 hrs. 3d yr. 12 hrs. 4th yr.	Oral and Maxillo-facial surgery Dental foci and necessity for eradication of dental sepsis Harelip and cleft palate Jaw ankylosis. Fractures Ludwig's Angina. Diseases of salivary glands. Tumors		Very little time given to diseases relating to the teeth except dental foci and surgical procedures to eliminate dental sepsis.
6	6 lectures (Reduced from 12) 30 hrs. clinical clerk (2 wks.)	Embryology. Histopathology of teeth and investing structures with emphasis on periapical and periodontal lesions Oral hygiene Restorations and procedures (Oral surgery demonstrated during clerkship)		Medical students encouraged to examine and make diagnosis and render treatment if possible.
7	16 hrs. (15 lectures, 1 exam.) 1 semester	Terminology, Eruption and Anatomy Occlusion Caries Pedodontics Pulp disease and treatment Periodontal disease Focal infection Oral diseases Tumors, extractions and anesthesia Radiology Restorative dentistry	2 1 1 1 1 3 1 2 2 1 1	

		Focal infection	1	
		Oral diseases	2	
		Tumors, extractions and anesthesia	2	
		Radiology	1	
		Restorative dentistry	1	

No. of School	Time Spent	Content of Course	Hours	Remarks
8	9-11 hrs. (1 quarter)	General—Public Health Dentistry	1	
		Diagnosis—Radiology	2	
		Fillings	1	
		Children's Dentistry	2	
		Acute diseases of the mouth	1	
		Prostheses	1	
		Fractures	1	
		Nutrition	1	
		Pulp involvements and therapy	1	
9	12 hrs. (1 quarter)	Formation and Eruption	1	
		Control of Dental Caries	2	
		Dentistry for Children	1	
		Preventive Orthodontics	1	
		Diseases of Mouth—oral manifestations of Systemic Disease	1	
		Periodontal Disease	1	
		Clinical Pathology	1	
		Oral Surgery and Exodontia	2	
		Radiographic Interpretations	1	
		Tooth Replacement	1	
10	4 hrs. (Part of Public Health)	Public Health Dentistry, Terminology and Anatomy	1	Medico-dental relations stressed.
		Development (eruption) and Malocclusion	1	
		Oral Pathology	1	
		Oral Hygiene and Diagnosis	1	
11	8 hrs.	Anatomy and Histology of Teeth and Periodontium (rickets and congenital lues)	1	Bibliography at end of each lecture. Case histories. Medico-dental relations stressed.
		Dental Caries	2	
		Focal Infection	1	
		Periodontal Disease	1	
		Oral Manifestations of Systemic Disease	2	
		Malocclusion and Exodontia	1	
12	11 used 1 quarter?	Outline of Merritt & McCall		Make students aware of dental problem and relation and significance to body economy. Numerous practical cases. "A thoroughly clean, well developed tooth will not decay, nor will the gums around it be diseased."
		Adding emphasis on:		
		Caries with Therapy		
		Fracture with Therapy		
		Prenatal Care, Feeding, Diet		
13	15 hrs. (Continuation of Public Health) (4 hrs. of lectures on Oral Surgery in addition)	Formation, Form and Arrangement of Teeth	1	
		Calcium Metabolism and Teeth, Dystrophies, Enamel Aplasias, etc.	2	
		Oral Hygiene	1	Four hours in addition in clinic observing "routine" dental diseases —caries and periodontoclasia.
		Dental Caries Including Periapical Infections and Disturbances and Their Therapy	3	
		Control of Dental Caries	1	
		Restorations—Treatment of Dental Caries	1	
		Pedodontics	1	
		Orthodontics	1	
		Periodontal Diseases	1	
		Vincent's Infection	1	
		Radiographic Diagnosis	1	
		a. Normal Landmarks c. Periapical Disturbances		
		b. Caries d. Periodontal Disease		
		Oral Manifestations of Systemic Disease	1	

Since this study was limited to teaching programs in dentistry in the undergraduate medical curriculum, these schools were eliminated. Out of the remaining 22 schools, 18 were selected as apparently presenting a fairly well rounded course and warranted personal inquiry. Accordingly, a letter was sent to the individual in charge of teaching the course in these several institutions, requesting more complete information. The specific information requested included: (a) whether the course was required or not and whether it was part of another course in the medical curriculum; (b) a brief description of the content of the course, including some indication of the time allotted to each topic; (c) the

TABLE 2.—DISTRIBUTION OF SUBJECT MATTER.

Medical School (No.)	Embryology, Histology, Anatomy, Development and Growth	Malocclusions Orthodontics	Pedodontics	Dental Caries	Oral Hygiene and Preventive Dentistry	Oral Surgery, Surgical Lesions, Fractures, etc.	Periapical Diseases and Treatment	Focal Infection	Radiodontics	Restorative Dentistry	Oral Manifestations of Systemic Disease	Periodontal Disease	Other Topics
1	X				X		X	X			X	X	Oral lesions
2		X			X	X			X	X		X	
3	X	X		X			X	X				X	Comparative dentitions Dystrophies of teeth Soft tissue diseases
4	X			X	X	X	X[1]					X	Medico-dental relations
5						X		X					
6	X				X	X[2]	X[2]			X		X[2]	
7	X	X	X	X		X	X[4]	X	X	X		X	Oral diseases
8			X			X[5]	X[4]		X[6]	XX*			Public health dentistry
9	X	X	X	X		X			X	X	X	X	Clinical pathology
10	X	X			X[3]								Public health dentistry
11	X	X			X	X		X			X	X	
12				X[4]		X							Prenatal care, feeding and diet
13	X	X		X[4]	X	X	X		X		X	XX*	

1. Included in "Dental Caries."
2. Oral surgery demonstrated during surgical clerkship.
3. Included under Histopathology.
4. Including treatment.
5. Fractures of jaws.
6. And "diagnosis."
* Two lectures (See Table 1).

total time spent in teaching dentistry; and (d) the general reaction of the teacher as to the efficacy of the teaching. Replies were received from twelve lecturers and table I is a summary of the data obtained.

No attempt at statistical analysis will be made, since the data do not lend themselves to such treatment and this study is not intended to be a statistical one, but to indicate a trend toward a desirable goal.

In table 1 the various colleges were numbered in alphabetical order and the (1) time spent, (2) content of the course and (3) remarks were noted opposite each.

Under "time spent," the total number of hours devoted to dentistry is noted, together with a translation of this time into terms of semesters or quarters. There is a spread in the number of hours (No. 8) to correspond with the length of the quarter. Note is taken as to whether dentistry is a separate course, or is presented as part of another course.

Under the heading "content of course," a list of the various topics is made, together with the number of hours (lectures) devoted to each, as far as possible. It is notable that overlapping of subjects is correlated with the total amount of time spent; this is to be expected, since, where time is short, several topics must of necessity be covered in one lecture.

In table 2 the various topics head the columns, grouping them where it seems justifiable. For instance, embryology, histology, anatomy and development and growth may all logically be grouped together. One of the schools (No. 8, table 2) separates fillings and prosthodontics; this seems artificial, especially for presentation to medical students, but reference to table 1 shows that there were two lectures, one on each of these topics.

TABLE 3.—DISTRIBUTION OF TIME ALLOTTED TO THE VARIOUS TOPICS.

Topic	No. of Schools Specifying Topic	No. of Hours If Specified
Embryology, histology, anatomy, growth and development	9	7
Malocclusion, Orthodontics	8	5
Periodontal Diseases	9	8
Oral hygiene and preventive dentistry	7	3
Periapical diseases and therapy	7	3
Focal infection	5	2
Pedodontics	4	5
Dental caries	6	8
Restorative dentistry	6	6
Radiodontics	5	7
Oral manifestations of systemic disease	4	4
Oral surgery, surgical lesions, fractures, etc.	10	14

The footnotes to table 2 indicate places where the material is covered under some other topic.

Table 3 is a time summary of the topics covered in the lectures. The number of hours, where specified, is not to be taken as any sort of criterion, because in a number of instances, especially where the total time allotted was short, the distribution would be difficult to determine. For example, it would be difficult to specify the time allotted to the topics of growth and development, malocclusion, periodontal disease, focal infection and oral hygiene and preventive dentistry, all these covered in three hours!

DISCUSSION

From table 1, it may be seen that the time spent varied from a minimum of one session of three hours' duration to a maximum of about two semesters, with eight of the courses being one quarter or one semester in length. It is very interesting also that two schools (Nos. 3 and 6) have set aside time for medical

students at least to observe dental operations and in one instance (No. 6), perhaps, to do some simple treatment. It seems significant that this situation obtains for it gives the medical student an insight, such as he would get in no other way, into the complexities of modern dental operative and therapeutic procedures.

In many of the replies, the lecturer stated that presentation of patients illustrating particular oral disturbances was an important part of the lecture material. It is to be hoped that medical students will see more dental therapy in the future as well.

It seems that some application of the seminar plan (No. 3) would be particularly appropriate to the presentation of some of the material. The active participation by the student in the learning process is an important pedagogical procedure. However, because of the limitation of time and the amount of material to be covered, it seems rather an unwieldy technique for covering adequately all the topics which are listed.

In table 2 the headings of the columns are entirely arbitrary. It was sometimes quite difficult to determine under which of the headings the material in a lecture fell. For instance, opposite medical school No. 1, under "other topics," we have listed oral lesions; it was difficult to decide whether this was an amplification of oral manifestations of systemic disease, whether it should be entered under surgical lesions, or whether it was a separate topic as we finally decided. The same is true of soft tissue diseases (No. 3). A few of the lecturers forwarded the course outline and from this such problems as those just discussed could be solved easily. It was because of this clarification that we made a separate topic of clinical pathology (No. 9), instead of including it under some other heading.

A brief summary of the program at the University of Nebraska College of Medicine is included. The outline of the course is specified in tables 1 and 2 (No. 13). No attempt is made to present illustrative cases before the class since each student spends a total of four hours in the dispensary clinic where he has a much better opportunity to observe the "routine" diseases of the oral cavity. Since the course emphasizes the public health and preventive aspects of dentistry, it is felt that the student should be made aware of the manifestations of the ordinary dental diseases, dental caries and periodontal diseases. Tumors and other similar mouth lesions are comparatively rare and it is felt that long experience is necessary in order to have a thorough knowledge of this complex part of dentistry.

During the student's four hours in the dental clinic, he sees an average of four or five patients, taking their history, making a tongue blade or mirror inspection and arriving at an "impression" of a diagnosis. Frequently, no such impression is reached at this time, for the patient must be referred for radiographic or laboratory studies as aids in arriving at a diagnosis. Also, frequently, the student misses the diagnosis, through inexperience, or overlooks other mouth conditions which change the whole picture. However, the case is discussed in

as complete detail as possible and such errors are pointed out. It is felt that the student learns much more by his error and that whatever he has overlooked will be impressed much more sharply on his memory.

SUMMARY

Since considerable time in the undergraduate dental curriculum is being devoted to instruction in the fundamentals of medicine, this study was undertaken to determine the amount and extent of teaching of dentistry in colleges of medicine. A review of the bulletins of 62 colleges of medicine which were on file revealed that 26 included at least some mention of dentistry and 18 apparently devoted some time to dentistry as a separate study. On further inquiry, 6 of these 18 were found to spend one semester or one quarter on lectures and two devoted additional time to clinical observation of dental therapy.

In view of these findings it is apparent that the field of the teaching of dentistry in colleges of medicine is still wide open. Considering the proved integration of the mouth in the body, there is a definite omission in the medical student's education if dentistry is neglected.

BIBLIOGRAPHY

1. Massler, Maury: The Teaching of Stomatology to Medical Students. J. A. A. M. Coll. 18:304 (Sept.) 1943.
2. Asgis, Alfred J.: Teaching Dentistry and Social Medicine in Medical Schools. J. Dent. Educ. (April) 1942.

Johnson, A. LeRoy: Stomatology: A Problem in Education. J. A. M. A. 92:1500 (May 4), 1929.

Kolmer, J. A.: Advisability of Didactic and Clinical Instruction on the Fundamentals of Dentistry for Medical Students. J. A. A. Med. Coll. 14:391 (Nov.) 1939.

Trends in Medical Education

The Clinical Clerkship

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Knowledge essential for the practice of medicine cannot be learned solely through books and lectures, but through active contact with the patient as an individual. By means of this exposure or clinical clerkship, the student could obtain the proper perspective, discipline and the ability to apply and interpret scientific facts. Fundamentally, these principles still exist and the burden of accelerated teaching does not exaggerate the problem, but rather emphasizes the significance and importance of proper methods of teaching, both in preclinical and clinical subjects.

The clinical clerkship today, particularly under the stress of the accelerated program of medical education, needs clarification of function and greater stress as to its educational values. It demands more unanimity of purpose in the assignment and supervision of this work. It matters little whether the third year students are assigned to the wards and fourth year students to the clinics, or vice versa, for these are matters of individual opinions, influenced by geographical location, clinical facilities and manpower of teaching staff. But it is of vital importance that all medical schools and all departments in the medical school of the clinical years utilize this plan in an integral relationship with the clinical program of the third and fourth year. Many doctors associated with medical schools fail to realize that the clinical clerkship[1] represents the beginning of a period of supervised clinical experience which blends later with the internship and culminates with the hospital residency. When organized properly, the clinical clerkship provides basic instruction in the proper methods of case work-ups, forces the clerk to think and work independently, and, above all, lays the foundation for continuing his education after graduation.

Dean Hetrick,[2] in a recent communication, aptly describes the various phases and obligations of a clinical clerkship . . . "briefly, the clinical clerkship may be defined as the most junior appointment on a house staff. The clerk is subordinate to the most junior intern, and in the house staff organization occupies a position, when compared to the military service, as equivalent to that of a sergeant. In the administrative organization, he is subordinate to the other members of the house staff, as well as the attending staff, and of course, the hospital administrator. From the professional viewpoint, he should act much as would a general practitioner having such a patient as has been assigned to the clerk. He should be responsible for a complete "work-up" of the patient, under supervision. This supervision may be defined as guidance, and the clerk's supervisor should go over the clerk's work with the purpose in mind of developing a thorough discussion of the patient's problems from the etiological, diagnostic and therapeutic view-

point. Prevention and social problems involved should be included. While the purposes of a clerkship are to develop practical knowledge of illness acquired from individual patients, knowledge of techniques and the various theories concerning an illness must be included, for of course, those things that are only theoretical today, become the practice of tomorrow. A clerk's instruction, then, should be individual, the result of personal experience with the patient, it should be guided, and should include the assumption of responsibility."

It is a singular fact that many educators differ little in the proper evaluation of certain aspects of undergraduate medical teaching, but many completely ignore or fail to realize the importance of first defining and properly evaluating the position of their particular subject or department in the general curriculum. For example, surgery can never be accepted as an indisputable part of undergraduate teaching if it is to imply the teaching of reparative manipulative maneuvers and operative procedures. Such teaching is definitely of a postgraduate nature. However, one could dispute the need and absolute necessity of incorporating in the undergraduate course a surgical program of instruction in the fundamental understanding of the various injuries and pathologic states of patients who can be treated by surgical procedures, plus the basic understanding of the principles involved in such treatment.

The original plan for clinical instruction and clerkship called for little didactic work in the third and fourth year. This was advised so that all of the third and fourth year could be devoted to actual clinical work on the hospital wards and in the outpatient department. With an acceleration in the teaching program, the third year could no longer be kept free for clinical work and on completion of the preclinical course with few clinical lectures, it became imperative to continue didactic lectures in the third year. This has been so arranged at the New York Medical College, that on three mornings a week and three afternoons a week the third year student is given the opportunity to be assigned to the various clinics for definite periods, during which they have few, if any other, responsibilities. Such a student is permitted to take histories, make physical and laboratory examinations, but unlike the fourth year student is not responsible for the complete case work-up. He now plays a minor role, but soon feels that he has definite responsibilities which increase as he enters the fourth year. This setup still demands classroom work in the third year, but permits and prepares for an ideal clerkship for the fourth year student. It is planned that with the ultimate discontinuance of the accelerated program, the third year student may assume more responsibilities in his clinical work with an accompanying reduction of classroom work to a minimum and complete lack of didactic lectures and textbook assignments. Such a change is proposed on the sound basis that from an educational point of view it is far better for the student to acquire experience in approaching the problems of medicine himself, rather than to learn innumerable facts which he usually soon forgets. Most educators agree that the proper time for a student to study a disease is at the time he sees and actually studies a patient suffering from that disease. Yet such drastic changes are challenged by men who have devoted many years to clinical teaching. Dr. Louis

René Kaufman,[3] Head of the Department of Surgery, believes that "no clinical clerkship can prove efficient in accomplishing its object unless the student first has a basic background of sound didactic and systematic understanding of at least the major and important subjects he will study. He needs didactic lectures to acquire a comprehensive foundation on which later to build piece by piece the complicated structure of each problem in surgery. Such a course should include the principles of surgery and a review of general regional surgery. I do not favor his doing this on his own while he is a clinical clerk."

We have on several occasions, in a most informal manner, interrogated student clerks with pertinent questions. Their answers, in general, imply that the clerk is at first overwhelmed by the type of work he is required to do, and very similar to his first weeks in medical school, he is a bit bewildered. He begins to get his "ward legs" and is soon so engrossed in his work that the days "fly by" and it is with regret that he must leave his ward for some other phase of his clerkship. Some of these clerks have repeatedly told me that it was their first grasp at what being a doctor really means; and others, "I never realized how little I knew," or "How much there is to learn." Still others are annoyed because housing facilities at the hospital are not at their disposal, for they would willingly stay all night. These are not prompted answers, and in no way made for political or favor seeking reasons. They are prompt, extemporaneous and enthusiastic responses. All are indicative of a healthy attitude which has undoubtedly always existed in the student, dormant and not aroused until after graduation, and the commencement of internship. Of course, at times, there will be a conflicting opinion from a clerk; but I have always found such opinions usually emanating from the student who has not matured sufficiently to appreciate the opportunities offered to him, and grasp the true significance of a clinical clerkship. As a rule, this is the type of clerk who must be shown everything, including how to wear a coat, or even to the degree of receiving instruction on how to put on a finger cot. He must be shown everything, and though not necessarily a mediocre student, he continues to reflect the type of elementary education to which he was exposed. Fortunately, such students are in the minority, and though they will always be present, despite continued development in progressive education, this should never be offered as an obstacle in the further development of clinical clerkships. Further, since such problems often are manifest in young graduates, it is better to cope with the situation prior to graduation, that is, during the phase of clinical clerkship. In both instances, the problem is gradually overcome by guidance, maturity and experience.

The value of exposing the third year student to the student case method of learning medicine, has been accepted as a valuable stride forward in medical education. In fact, many believe that such practice of instruction should be started even earlier. MacArthur[4] points out that although the average medical student memorizes temporarily, for the purpose of passing course and board examinations, 80 per cent of an arbitrary selection of subject facts, there is fairly satisfactory evidence that he understands and retains less than 20 per cent, and that he has integrated and personalized less than 10 per cent. MacArthur be-

lieves that, in general, most courses are over-standardized and over-directed, with little opportunity for originality and even initiative, and that contrary to the belief held by most teachers, the student does not think because of an inability to do so, but more likely because of inopportunity. Such opportunity is made available in a clinical clerkship.

The value of this early clinical work cannot be over-emphasized. It serves as an adjustment period, and actually permits the student to "come down to earth." I have repeatedly had intelligent students tell me that the clinical work seemed so inexact and so vague. They could not reason why an attending surgeon came to a certain conclusion, for even though his judgment was correct, his logic did not seem as precise and exact as the approach one would have to some preclinical or laboratory problem. To me, this is always an encouraging sign, for it means that the student has reached a certain phase in his education when he no longer accepted with mere docility what was offered to him. This is not a contemptuous attitude, which unfortunately, is what it is branded by some teachers, but an inquiring attitude. I have repeatedly found such students to make excellent interns and residents, and ultimately to become devoted and competent clinicians. Such students soon learn that each case differs in its actual physical aspects, and that in reaching a decision as to what conditions actually exist, the most exact data available are not sufficient, and that ultimately the decision is influenced by judgment and insight. Such training can never be given by texts or lectures.

Under the present curriculum at the New York Medical College, the fourth year student is entirely free of all classroom work and his time is devoted entirely to a clinical clerkship in the various departments, with particular emphasis on the medical, surgical and pediatric divisions. These students report to the hospital and remain there all day, with the exception of the noon hour and biweekly attendance at departmental conferences. In addition, teams of two are assigned to the admitting room of the hospital where they remain until midnight on the nights of admission. Here they are given the opportunity of seeing the cases as they are admitted to the hospital, and permitted to examine and diagnose and allocate these patients under the supervision of the admitting officer of the night. They follow the case through the surgical department if they are assigned to surgery at the time. The quality of clerkship offered varies greatly in the different hospitals affiliated with the medical college, but in all three institutions it is planned along similar lines, with basic rules and regulations. The entire class is divided into three sections, so that in addition to rotating through the various services, they also rotate from one hospital to another.

In the department of surgery, emphasis is placed on teaching the clinical clerk the diagnosis of surgical conditions, preoperative and postoperative care, and the handling of emergencies. This teaching is primarily supervised by the various members of the staff, and intimately supervised by the residents, interns and instructors who are assigned to small groups of students. One instructor is assigned to a group of students with whom he guides along lines of adaptation and encourages reading and supplementary reference work. This is not given

in a didactic fashion, but in an informal way, similar to a round table discussion. At these seminars, which are held at three hourly sessions during the week, the discussion is primarily carried on by the senior clerk, and only interrupted by the instructor, when help or guidance is indicated. In addition, the clerks attend the weekly surgical staff conferences. As a rule, each case at the surgical staff conference is presented by the senior surgical clerk assigned to the case, who narrates all the pertinent data and usually shares in the discussion. At various times, the senior members of the surgical staff hold informal conferences with the group of senior clinical clerks for further review of their problems. We believe that there is always need to provide in all clinical teaching an opportunity for the student to discuss his difficulties with his teachers for only through such personal discussion can the student clear away confusion in applying theoretical dogma to living disease variations.

We believe that similar to the training of a surgical intern, the surgical clerk should be given opportunities to become acquainted with the pathology encountered during operation. For this reason, we permit the student assigned to a case that comes to operation to scrub and join the surgical team. This is done primarily to acquaint him with operating room decorum, and to visualize the pathology accountable for the disease he suspected, recognized or overlooked. As mentioned above, we believe that these clerks should be taught only those surgical techniques that every general practitioner should know, and that the teaching of the techniques of operative surgery should be postponed until they become residents.

A word about laboratory work. Too often the clerk is required to do innumerable blood counts, urinalyses, and the taking of blood for chemical analysis. In a busy ward, particularly with the shortage of interns, this demand may consume too much of the clerk's time, with little reward for his efforts. True, it may serve as a partial and, at most, unsatisfactory solution of manpower shortage, but has little value from an educational point of view. The clerk should spend a certain portion of his time in the laboratory doing his blood counts, etc., but should not be engaged in routine laboratory work without definite relationship to a specific patient or patients. Like[8] many others who have studied this problem, we feel that when clinical laboratory work is abstract in character, and the student unable to definitely associate it with a patient, little value is obtained from the effort. Under such circumstances, the clerk loses all interest in laboratory work, and will not correlate it with clinical findings. To overcome this danger, it is advised that the clerk perform all possible laboratory procedures only on patients that have been assigned to him for study. This work should be conducted under the supervision of the physician in charge of the laboratories, who should demonstrate and check procedures and tests, and discuss with the clerk the implications and value of the laboratory findings. In this way, the clerk will learn the value and limitations of the various laboratory procedures.

As much as time permits in the activities of a busy surgical service the clinical clerk should accompany his patient to all consultation services such as broncho-

scopy, gastroscopy, cystoscopy and peritoneoscopy. In this way he may learn the relative importance of these procedures in general surgery, as well as their specialized technique but basically to appreciate their relative significance. He should especially share in those special consultation services so important in the selective study of all patients. In this way electrocardiography becomes a vital and not an academic factor in surgical practice. The integration of specialties into their relation to general surgery is one of the chief functions of a good clinical clerkship. Carleton[6] most adequately describes this phase of education by saying, "Consultations broaden one's view and add to one's knowledge. Consultations should be part of the work-up of a case, not a rite for the moribund."

No medical course is perfect, nor will any future course be so, so long as progress in medicine continues. But certain factors which influence the policy of a medical school must never be overlooked, and if a reformation period points to certain fallacies it should not be neglected or other experimental methods be adopted without first examining methods that have been put to the severe test. But this must not be done without the full realization that "true education,[7] particularly at the professional level, is self education. Medicine must be learned by the student if he is to develop judgment, discrimination and intellectual self reliance. The newer aims and methods place greater responsibility on the student for his own training. The crucial element in medical education is the student, upon whose character, interest, preparation, ability and industry so largely depend the results of medical training." In no phase of medical education is this more keenly appreciated than during the periods of junior and senior clerkships.

BIBLIOGRAPHY

1. Flood, Charles A.: Clinical clerkships for undergraduate students. J. A. Am. M. Coll. 14:145-149 (May) 1939.
2. Hetrick, J. A. W.: Personal communication, 1944.
3. Kaufman, Louis Rene: Personal communication, 1944.
4. MacArthur, Charles G.: The student case method of learning medicine. J. A. Am. M. Coll. 15:245-248 (July) 1940.
5. Medical Education in the United States, 1934-1939. Am. M. Assoc., 1940.
6. Carleton, Sprague: Personal communication, 1944.
7. Rappleye, Willard C.: Postwar Medical Education, J. A. Am. M. Coll. 19:65-69 (March) 1944.

Agreement on Internship Placement

by

Association of American Medical Colleges
American Medical Association
American Hospital Association
American Protestant Hospital Association
Catholic Hospital Association

There has been increasing concern among medical colleges and hospitals over the excessive competition for the number of intern applicants available which has resulted in attempts to sign medical students to internship contracts earlier and earlier in the medical course. As the first step toward correction and better control of this problem, the Council of the Association of American Medical Colleges voted not to release information concerning student records in support of applications for internship appointment until after the end of the junior year. This was unanimously approved by the Association at its executive session attended by the representatives of all the medical colleges in Detroit in October, 1944. It has since been reconfirmed by the Executive Council of the Association at its regular meeting in February, 1945. In order to work in close harmony with the hospital associations, a conference was called at the Palmer House in Chicago on February 11, 1945, attended by the following delegates:

Association of American Medical Colleges: Jean A. Curran, M.D.; Russell H. Oppenheimer, M.D.; Loren R. Chandler, M.D.; Ewen M. MacEwen, M.D.; Harold S. Diehl, M.D.; Arthur C. Bachmeyer, M.D.; Fred C. Zapffe, M.D.

American Medical Association: F. H. Arestad, M.D.

American Hospital Association: Robin C. Buerki, M.D.; Hugo V. Hullerman, M.D.

American Protestant Hospital Association: Reverend Joseph A. George, E. I. Erickson, Leo Lyons.

Catholic Hospital Association: Reverend John W. Barrett, Reverend John J. McInerny.

At this meeting it was agreed that the restriction on sending information to the hospitals from medical schools should include letters of recommendation and summaries of scholastic records from the deans' offices and letters from members of the college faculties. Also, staffs of medical college teaching services should very carefully refrain from conversations with their clinical clerks which may be interpreted as promises of internship appointment.

DATES FOR APPOINTMENT OF INTERNS

On motion by Dr. Chandler and seconded by Father Barrett, it was voted that hospitals be requested not to make appointments for internships until they

receive recommendations and credentials covering the first three academic years of medical school work (after completion of the junior year).

DEFERMENT OF APPLICATIONS UNTIL END OF JUNIOR YEAR

It was moved by Dr. Diehl and seconded by Dr. Rees that students be discouraged from filing their applications and that hospitals be requested not to consider applicants for internship until the student has completed the work of a junior year in medical school.

TIME ALLOTMENT FOR CONSIDERATION AND SIGNING OF CONTRACT

It was moved by Dr. Bachmeyer and seconded by Mr. Erickson that the hospital associations request their members to grant student applicants an interval of ten days for acceptance or rejection of an appointment to an internship. The motion was carried.

UNIFORM APPLICATION BLANK FOR INTERNSHIPS

It was voted that such a blank be prepared and submitted for approval to the several participating organizations and the following committee was appointed: Dr. Jean A. Curran, Chairman, Association of American Medical Colleges; E. I. Erickson, American Protestant Hospital Association; Reverend J. W. Barrett, Catholic Hospital Association; Dr. H. V. Hullerman, American Hospital Association.

These actions were referred for approval to the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association through their representatives present at this meeting and the formal approval of each has been secured. The actions were also submitted by Dr. Zapffe to the Council on Medical Education and Hospitals of the American Medical Association, which was then in session, and the Council voted unanimously to approve these recommendations in principle as highly desirable objectives but said it could not take the responsibility for working out the technical details and making them effective. The agreement of the medical colleges was assumed because of the action by the Council on the previous day and in view of the fact that the majority of the Council was present at this conference.

SUMMARY

At a meeting on February 11, 1945, representatives of the Association of American Medical Colleges, the American Medical Association, the American Hospital Association, the American Protestant Hospital Association and the Catholic Hospital Association agreed on the following program for control of internship placement:

1. Information regarding student records in support of applications for in-

ternship appointment are not to be released until the end of the junior academic year. This restriction includes the sending of information of letters of recommendation by deans and members of medical college faculties, and summaries of scholastic records.

2. Hospitals are requested not to make appointments for internships until they have received recommendations and credentials covering the first three academic years of medical school work.

3. That medical students be discouraged in filing their applications and that hospitals be requested not to consider applications for internship until the student has completed his junior year.

4. Student applicants will be granted an interval of ten days for acceptance or rejection of an appointment for internship.

5. A subcommittee has been set up for the purpose of preparing a uniform application form for internship which will be submitted to the participating organizations for approval.

Since the great majority of medical schols will not complete the current academic year until some time in June, it is anticipated that internship placement this year will not begin until after the first of July.

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Lessons from Military Sponsored College Training

Doubtless education has learned some practical lessons from its experience with wartime speeded up programs. A little publicized preprofessional program was the Premeteorological Training Program of the Army Air Forces which graduated its last class in May, 1944. Those connected with the program are beginning to appraise their experiences. Some of their findings are of significance for wartime and peacetime education. Medical colleges can profit from a careful study of this program to the end that they will revise their curricula to meet a better course of education. Mr. Eldon L. Johnson, director of the graduate School, United States Department of Agriculture and National Academic Director of the Premeteorological Training Program for the Army Air Forces, reports on this experiment (*J. Higher Education,* March, 1945).

First, students were not assigned to the course arbitrarily. They were carefully selected on their own application as a privilege. Recruitment rested heavily on civilian consultants, one an experienced personnel man, and the others college and university representatives. Second, the curriculum was genuinely integrated. Third, the academic part of the program was left exclusively to experienced academic personnel. Fourth, definite provision was made for maximum interchange of ideas and suggestions as the program progressed. Mr. Johnson says:

"One of the first lessons to be drawn from experience in premeteorological training is the conviction that able students can progress much more rapidly than expected in peacetime. It is apparent, however, that no miracle can be performed, as one might surmise from some of the more optimistic claims that have recently been made for military-sponsored education. A desirable pace seems to lie somewhere between the practice in peacetime and the practice in the more difficult military-sponsored programs. The gains of condensation and acceleration soon begin to be offset by losses in assimilation and in perspective, to say nothing of losses in extra-curricular education and social development. Nonintellectual factors contribute too much to success to be overlooked or neglected. Limits on desirable acceleration are set by the well-known fact that students learn best if they have time for the learning to 'soak in'; time for the essential fact, principle, skill, or attitude to be approached from several different avenues; and time for application as well as exposition and demonstration. Furthermore, they learn best if they see the purpose of what they are learning and its relation to their interests and needs. In this respect, some of the military-sponsored programs undoubtedly enjoyed superior student motivation.

"The premeteorological programs showed that a group of above-average students can successfully carry a program of such difficulty and speed that some able university spokesmen thought it quite impossible in the beginning. How could high school graduates (some had begun college) be expected to take, within a year, mathemathics through differential equations and selected topics in advanced calculus, plus sophomore-level physics, plus junior-level vectorial mechanics, and take them simultaneously rather than in the usual sequence?

"Perhaps it does sound incredible, but

several thousand students did it—and did a cretitable job with geography, history, composition and speech at the same time! The program had a reputation of being 'tough,' high standards were maintained, and about 25 per cent of the students were eliminated for academic reasons; but the remaining 75 per cent found the program neither too severe for their health nor their ability. They and their professors would have preferred more time for assimilation and, without the urgency required by war, somewhat more time should certainly have been allowed. The students, like all students, felt they could use more leisure, but they somehow found time to publish newspapers and yearbooks, organize glee clubs and bands, give skits and minstrel shows, and hold dances. Their performance clearly demonstrates that colleges and universities have both underestimated and underutilized the adaptability and learning capacity of their students.

"Education which is conscientiously seeking to adjust itself to the postwar world on the basis of significant experience in wartime cannot afford to overlook the advantages of a more closely integrated curriculum. The achievement described in the preceding paragraph was possible only because the courses in mathematics, vectorial mechanics, and physics were carefully planned together, the course outlines made to dovetail, the schedule of content in each course timed to make maximum use of content just covered in the other two courses, and continuous coordination provided by a coordinating committee of representatives of each of these courses at each college or university. Without such integration these three courses could not have been taken simultaneously."

Success with the integrated approach meant teamwork, broadened interest and shared experiences. It was satisfying to the student to find that he could apply today in physics what he learned yesterday in mathematics. Success in such an integrated program depends on meticulous planning in advance so that its parts will mesh as they move toward a common goal. Coordination along the way will be necessary to take care of unforeseen difficulties.

The medical curriculum must be based on integration and coordination if it is to accomplish the end desired. Instruction by rigid departmentalization is outmoded and can no longer be regarded as being educational in the present accepted sense of the term. Duplication and overlapping can be effective if they are based on integration and coordination. The reason why the student must know this and that must be stressed. That can only be done by effective integration. What has until now been a course extending over four academic years, but strictly departmentalized, should be fluid, coordinated, so as to represent a course of four years' duration.

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Postwar Premedical Education

In the *Scalpel,* February, 1945, official publication of the Alpha Epsilon Delta Honorary Premedical Fraternity, is published an article on "A Plan for Postwar Premedical Education" (name of author not given) which is well worth reading. Every one working in this field, preparing students for medicine, and every medical educator should read this article. It is a fine presentation of what the intending medical student should do in college and what kind of a student medical schools want. The element of time spent in college is minimized; character is stressed as well as the influence of a teacher on the student. "Probably more important than 'Courses' is the influence on the student by the people who guide his thinking. The example shown him by his professors, both in the classroom and out, will affect his personality. . . . It is much more difficult to determine whether an applicant is psychologically prepared to study medicine than to determine his technical preparedness. . . . Premedical education involves more than some years in a college or university. . . . Knowledge and character are not necessarily determined by credits and grades, but can be more nearly revealed by an extensive sampling

of the individual's ability through academic and psychological examinations. . . . The more thoughtful study of the 'human sciences' the student has done, the more mature his experience will be, the more understanding he will become."

These few quotations should suffice to prompt careful reading of this article. It is to the point. Teachers in colleges and universities should give deep thought to their role and influence in the preparation of students for medicine. Medical educators have always, for many years, stressed what kind of student they want; that "credits" and "years of study" or attendance in college are not as important as what the student has done for himself; whether he has acquired that knowledge and attitude of mind which is all important if he is to become a good practitioner of medicine. Too often the catalogs of medical schools apparently stress "credits." And, they list too many subjects which are "required." After all, a good sound, basic, general education is what the student should have if he is to succeed in the study of medicine. The shockingly large mortality in medical school is sound evidence of the failure of the colleges to prepare their students for this field of activity. As one college professor once said: "Medical schools want 'educated' men and women, not 'trained' men and women. Many animals can be trained to do tricks; the acrobat trains himself to do his stunts. The prospective medical student must be educated, not trained.

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The Curriculum

The curriculum has for a long time been the butt of jokesters. "Curriculum making" has often been termed a favorite "sport" of those who had time on their hands. Nevertheless, it has undergone many changes for the better. It is no longer jammed with required attendance on classes from 8 A. M. until 6 P. M. The curriculum of every medical school shows many unassigned hours, which is as it should be. The trend in teaching is definitely toward a reduction in the number of required hours to the end that the student will have time to read, to study and to think. He must be put on his own more than he has been. He must play a major role in acquiring his education, but always under careful and thorough supervision.

Good will come out of the war for education, general and professional. Colleges and universities are well aware that they must revise curricula to meet conditions which will confront them after the war. Medical schools, too, have been thinking along these lines. There is too much rigidity in the curriculum of today; too much departmentalization; too little integration and correlation. Every subject listed in the curriculum is related to every other subject. It is no longer a case of preclinical and clinical subjects. True, there must be departmentalization for administrative purposes but not for teaching. It is not good pedagogy to think of a subject as being unrelated nor to teach it as being unrelated. The clinical clerk has more need to know his anatomy than he did when he studied that subject in his freshman year. That is also true of biochemistry, physiology, pharmacology. All subjects are a composite. They are the warp and woof of a good practitioner of medicine. The aim of the medical school is to turn out good practitioners. Understanding, not memory, is essential.

Which brings us to the teachers. Teachers must give careful thought to how they teach rather than what they teach. They must be stimulating; be examples of what they want their students to be when they have finished their course of study in the medical school. They should teach by precept and example rather than by lectures. Many lectures are mere recitals of what is printed in a textbook,—which students can read to better advantage than will come to them by listening to a lecture. A good lecturer, a real lecturer, can do much good and stimulate. A "talker" can do much harm besides consuming valuable time.

Revision of the curriculum is in the minds of many faculties of medical schools. Some schools have already ap-

pointed a committee to consider revision of the curriculum. The war has shown that the curriculum can and must be revised on the basis of four years of study, separated as to time but not as to purpose of accomplishment. The years must be integrated and correlated. Time barriers must be broken down. Departmentalization cannot have a place in a good educational program. Something must always come first but it must be integrated with what follows. For example, anatomy should not be limited to the first year. It should continue on into succeeding years and be correlated and integrated with clinical teaching. Then anatomy has an important place, not as an isolated subject but as a subject that is fundamental in medical practice. It is not merely a discipline. It is the major subject in the freshman year and then should diminish in time—not importance—in the succeeding years, terminating, perhaps, in the junior year. That is also true of the other so-called preclinical subjects. Teaching in medicine and surgery, in many medical schools, begins in the freshman or sophomore years and increases in time in succeeding years. Other subjects follow the same pattern. That is integration and correlation. The student must be impressed with the fact that there is a reason why he should be thoroughly familiar with all these subjects; that they are all a part of the whole and not merely something to be "passed off" before proceeding to the next subject listed.

Now is the time to act on a revision of the curriculum. The subject has been proposed for discussion at the next annual meeting of the Association. The breaking down of departments for teaching will also be discussed. A start on this phase was made at the Detroit meeting. It is greatly to be desired that when the end of the war comes, medical schools will be ready to operate on a new curriculum, one which will be in keeping with present day trends in medical education.

Cooperation

For each and every one of us
Has duty plain and obvious
To make our plans victorious.
It's up to us to do our part
To make succeed whate'er we start,
To work for it with all our heart.

I wish that I had power to preach
This simple sermon far and wide;
A lesson plain it has to teach
To all who in our land reside.

These days are filled with problems tough,
The roads of life are very rough,
And there is misery enough!
And yet if all would lend a hand,
And only try to understand,
Ours would become a Happy Land.

Need I the moral emphasize?
I'm sure it's clear enough to all.
Cooperation underlies
Success. Without it nations fall.

—Wayland Delano Wilcox.

College News

Ohio State University
College of Medicine

Rollo C. Baker, Ph.D., former chairman of the department of anatomy and for the past two years acting dean of the college of medicine, was made permanent secretary of the faculty of medicine. He will devote approximately one half of his time to administrative duties in the office of the dean and the remainder of his time to instruction and investigation in the department of anatomy. The newly created office of junior dean will be held by Dr. George H. Ruggy. Dr. Ruggy is assistant professor in the department of physiologic chemistry and pharmacology and in the department of medicine. Dr. Ruggy will divide his time about equally between the administrative duties of the new office and teaching in the departments with which he is now associated. Dr. Bruce K. Wiseman, as the new chairman of the department of medicine, is formulating plans that will make possible the introduction of new and expanded contacts in the clinical instruction of the junior and senior students. Dr. Henry E. Wilson, Jr., associate professor of medicine, was appointed assistant medical director of the Starling-Loving University Hospital and assistant chief of staff. He will work with the superintendent in an advisory capacity with reference to administrative problems in the hospital involving the practice of medicine. Dr. C. Joseph DeLor, assistant professor of medicine, is the new assistant medical director of the outpatient dispensary. Dr. Warren E. Wheeler, assistant professor of pediatrics, Wayne University College of Medicine, Detroit, has been named associate professor of pediatrics and will devote full time to teaching and research, chiefly at Children's Hospital. Dr. Jonathan Forman, lecturer in medicine, has been named professor of medical history. In his new position Dr. Forman will be responsible for the teaching of the history of medicine and for the supervision of the medical archives of the state of Ohio for the medical library. Dr. Frank F. Tallman, state commissioner of mental diseases, has been named assistant professor of neuropsychiatry and will correlate the teaching and research program at the university with his statewide program for the better care and treatment of the mentally ill. Dr. Doan has announced his policy of administration to include active participation in both teaching and research for all executive officers of the college of medicine, including the dean. Establishment of a medical and health center at Ohio State University at an estimated cost of $5,000,000 will be asked of the 96th Ohio General Assembly, now in session at Columbus. It is proposed that the legislature appropriate funds for the health center in addition to $12,500,000 being requested for other postwar building projects at Ohio State University. It is contemplated that the proposed medical center will include a new building to house the college of dentistry, an addition to Hamilton Hall, where the medical and dental colleges now are located, to provide adequate library facilities, and an 800 bed addition to University Hospital to furnish needed hospitalization facilities for central Ohio and to bring clinical teaching opportunities up to minimum standards. At present the college of medicine has two teaching hospital beds for each student.

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University of Texas
Medical Branch

The University of Texas Child Health Program, in cooperation with the Maternal and Child Health Division of the Texas State Board of Health, announces a postgraduate course in pediatrics to be held at the School of Medicine. It will be limited to 40 physicians, with tuition furnished by the State

Board of Health. Preference will be given to physicians of Texas recently returned from the armed services, and to physicians participating in the various well baby conferences in Texas. The faculty will include leading pediatricians from Yale, the University of Rochester, and Louisiana State University School of Medicine, in addition to the staff of the University of Texas School of Medicine. Application blanks for registration may be obtained from Doctor Arild E. Hansen, University of Texas School of Medicine, Galveston.

Doctor James Watson White of New York City inaugurated the John O. McReynolds Lectureship in Ophthalmology recently established at the Medical Branch, Galveston, by Colonel and Mrs. Frank W. Wozencraft of Washington, D. C. The inaugural lecture was given April 6th.

Dr. Ghent Graves, Mrs. George T. Morse, and Mrs. Laura Lee Graves Steel of Houston, Texas, have given funds to the Medical Branch to establish a research fellowship in internal medicine in honor of their father, Dr. Marvin Lee Graves, Emeritus Professor of Medicine. The fellowship will be filled annually by the department of medicine through the appointment of a graduate in medicine who is considered most likely to maintain the professional standards and ideals of Doctor Graves.

The Medical Branch announces the establishment of a postgraduate medical training program under the direction of Dr. George Decherd, Jr., associate professor of medicine. A special faculty committee will cooperate with Doctor Decherd in the development of a broad postgraduate medical training program which will embody three features: (1) short postgraduate conferences and courses on special subjects, to be held at the Medical Branch; (2) two day conferences to be given by members of the faculty in cooperation with county and district medical societies in various parts of this state, and (3) residency training for specialty board certification and specialty practice. Emphasis in residency training will be placed on preclinical laboratory work in the special fields in which the resident is interested. The preclinical laboratories of the Medical Branch will cooperate with hospitals approved for residency training in Texas in affording appropriate facilities for fundamental training in specialties. The first conference to be held under the auspices of the new postgraduate training program is being arranged by the Department of Pediatrics and the Child Health Program, under Dr. Arild Hansen, professor of pediatrics, for May 14-19. Forty physicians can be accommodated for the period.

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Creighton University
School of Medicine

A weekly case conference on psychosomatic medicine has been started for the senior students. Suitable cases are selected from the Medical Clinic of the Dispensary. A particular effort is made to secure patients who do not have an organic disease. The case is assigned to two students. The usual history, physical and laboratory examinations are carried out to eliminate or confirm the presence of organic disease. The patient is then referred to the department of psychiatry. A thorough study is made of the patient's emotional status. A particular effort is made to ascertain the presence and cause of emotional factors and conflicts. Following this investigation, the student in charge makes several calls at the home of the patient and endeavors to obtain the complete picture of the patient's background, particularly with regard to cultural environment, financial status, and other factors which might be responsible for the production of anxiety states.

While the patient is under investigation by the students and physicians, a thorough study is made by a social worker of the Omaha Catholic Charities.

When the above studies have been completed, the case is brought up at conference. The student in charge of the patient presents the medical, psychological and social aspects. A social service

worker adds the details of their investigation. The medical and psychiatric aspects, the psychological factors and the results of psychometric studies are discussed. The professor of physiology presents, whenever possible, experimental work which may explain the establishment and progress of the patient's present condition. After the diagnosis has been agreed on the therapeutic approach is discussed in detail.

In these conferences particular effort is being made to stress the following points: 1. That the emotions may produce disturbances in function, which without organic disease, may bring about true illness and incapacitate a patient just as completely as organic disease. 2. That it is the duty of the physician to obtain the confidence of the patient and make every effort to understand the patient in relation to his environment. 3. That the physician is not fulfilling his entire obligation when he dismisses these patients with the comment, "There is nothing wrong with you; forget it," and tags them with the label of a neurotic. 4. That a physician and a social worker must often cooperate in their efforts to secure complete information and that therapy must often be carried out with the help of competent social workers. 5. Particular emphasis is placed upon the fact that much needless surgery is done on patients whose symptoms are due to anxiety states and tensions rather than to organic disease. 6. That numerous operations serve only to accentuate the condition.

◆ ◆

Tulane University of Louisiana
School of Medicine

Graduate Course in Tropical Medicine and Medical Parasitology. This course is offered to physicians who desire to obtain a comprehensive knowledge of the diseases of warm climates. It comprises instruction in the etiology, epidemiology, pathology, symptomatology, diagnosis, treatment and control of these diseases.

The course consists of lectures, conferences, quizzes, practical laboratory work and demonstrations, together with the study of clinical cases. Approximately 50 per cent of the time is devoted to diagnosis and management of disease.

The course begins each fall late in September or early in October and extends through the first half of the school year, or approximately five months.

Fellowship students working in the department for a year or more begin their study with this course.

The course is open to properly qualified American physicians who plan to practice in warm climates as well as to those who desire training in this field for the care of patients in their own communities. Adequately trained physicians in Latin American and other parts of the world may also apply for admission.

The fee for the course is $300.00, of which $25.00 is payable on application and the balance on enrollment. Each enrollee must provide himself with a modern compound microscope equipped with oil immersion lens and a mechanical stage, a standard hemocytometer with necessary blood-diluting pipettes, a standard hemoglobinometer (as the Dare, Newcomer or Sahli), two Wintrobe Hematocrit tubes, microscope slides (½ gross 25 x 75 mm. and ½ gross 37 x 75 mm.), and microscopic cover-glasses (2 oz. No. 1, 22 mm. squares). Two long white laboratory coats should also be provided.

Beginning with the session of 1944-1945, Tulane broke the tradition of starting the freshmen students with the dissection of the human body by substituting instruction in biochemistry instead of gross anatomy.

◆ ◆

University of Georgia
School of Medicine

An Act to authorize and direct the Board of Regents of the University System of Georgia to construct and operate a hospital for the indigent sick or near indigent sick in conjunction with the State Medical College, out of funds in the building trust funds or any other money that they may be able to procure;

to repeal conflicting laws; and for other purposes.

Be It Enacted by the General Assembly of Georgia, and it is hereby enacted by authority of the same:

Section 1

That the Board of Regents of the University System of Georgia are authorized and directed to build, buy or lease a hospital for the indigent sick or near indigent sick to be operated in conjunction with the Medical College.

Section 2

The Board of Regents is authorized to use funds from the building trust fund for the construction of such hospital and any other money that they may be able to procure from any source.

Section 3

The Board of Regents is hereby authorized to contract with any hospital for clinical purposes and for the training of medical students of the university.

Section 4

All laws and parts of laws in conflict herewith be and the same are hereby repealed.

This Act was passed and is now a law.

Raymond P. Ahlquist, Ph.D., has been appointed assistant professor of pharmacology, to succeed Benedict E. Abreu, Ph.D.

◆ ◆

St. Louis University
School of Medicine

The Alpha Pi chapter of Phi Delta Epsilon has created a lectureship in honor of the late Dr. Hanau W. Loeb, formerly dean of the school. The presentation of the lectureship to the school of medicine took place April 9, by Dr. Arthur E. Strauss, St. Louis, past grand consul of the national organization of Phi Delta Epsilon, on behalf of the fraternity.

A grant of $3,200 offered by the Upjohn Company to the Wayne University College of Medicine for a study of blood volume and metabolic changes in cardiac patients was accepted by the Board of Education at its last meeting. The work will be conducted under the direction of Dr. Gordon B. Myers, professor of medicine, and Dr. Samuel Jacobson, assistant instructor in clinical medicine.

◆ ◆

University of Kansas
School of Medicine

The University of Kansas Endowment Association has received a $50,000 bequest under the will of the late Dr. Logan Clendening, to be used for the department of medical history. Dr. Clendening wished the money used to maintain the library of medical history, according to the state medical journal.

Dr. Paul Roofe has been appointed professor and head of the department of anatomy. Dr. Gordon M. Martin has been appointed associate professor of physical medicine. He will have charge of the School of Occupational and Physical Therapy. The legislature has apportioned $350,000 for an addition to the university hospitals. It will provide a surgical wing. A small psychopathic unit will be set up with funds for maintenance in addition to an extensive program for postgraduate medical education.

◆ ◆

University of Illinois
College of Medicine

Dr. George W. Wakerlin, Professor of Physiology and Head of the Department, University of Illinois College of Medicine, has been appointed to serve also as Assistant Dean in charge of teaching and research at the Rush-Presbyterian Hospital, Division of the University of Illinois College of Medicine.

Dr. Wakerlin will work with the administration of the hospital, the Rush faculty, and the College of Medicine in developing a comprehensive program of undergraduate and graduate medical education and research at Presbyterian Hospital and Central Free Dispensary. A number of appointments to research positions in the medical sciences are to be made as part of this program.

Dr. Warren H. Cole, Head of the

Department of Surgery, has been appointed Associate Dean.

◆ ◆

University of Chicago
Medical School

A grant of $175,000 to the University of Chicago for research in pediatrics from the estate of the late Dr. Walter H. O. Hoffmann was announced on March 28. The gift brings to $832,722 the amount for support of teaching and research into the care and nurture of children since Dec. 15, 1944, newspapers report. Other gifts to the university include $25,940 from the general education board for verbal tests in I. Q., $20,000 from the Sonia Shankman Foundation for scholarships and research in the university's orthogenic school, two of $15,000 for cancer research from the Albert and Mary Lasker Foundation and the Frances and Sidney Brody charitable fund, $15,000 from Mrs. R. S. Maguire for university support, $10,000 from T. Philip Swift for the department of medicine and $10,000 from the E. J. Brach fund for general research.

◆ ◆

Medical College of Alabama

It is planned to begin junior instruction in Birmingham some time in June. About one-half of the present sophomore class has elected to remain with the school.

Dr. Ray O. Noojin, Duke University School of Medicine, has been appointed associate professor of medicine and chief of the Division of Dermatology and Syphilology, effective September 1. Dr. Alan Hisey, George Washington University School of Medicine, has been appointed assistant professor of biochemistry. Miss Mary Ament, formerly librarian at the Bowman Gray School of Medicine, has accepted the position of librarian at Alabama.

◆ ◆

New York University
College of Medicine

The College of Medicine and Irvington House, sanatorium for cardiac children, Irvington, have established a medical affiliation to further the care and rehabilitation of underprivileged children with heart disease. Under the terms of the affiliation the college of medicine of the university will be responsible for the direction, supervision and administration of the medical and research program at Irvington House, the announcement stated. The sanatorium will be used as a teaching center to train young doctors in the early recognition and treatment of rheumatic heart disease.

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Columbia University College of
Physicians and Surgeons

The Lester N. Hofheimer estate has granted $35,000 to Columbia to finance the first year's expenses of the newly created Psychoanalytic and Psychosomatic Clinic for Training and Research. The grant comes from the estate of Lester N. Hofheimer, first lieutenant, Army Air Forces, who was killed in India in December, 1943, and is the first made in the field of psychiatry under the lieutenant's will. Lieutenant Hofheimer left the bulk of his estate, approximating one million dollars, to philanthropic enterprises, the distribution of which is left to the discretion of three executors.

Dr. Leo M. Davidoff, Brooklyn, has been appointed professor of clinical neurologic surgery. He is also to become attending neurologic surgeon at the Montefiore Hospital for Chronic Diseases about September 1.

◆ ◆

University of Wisconsin
Medical School

A program will be given by the faculty May 15 and 16 in honor of Dr. Joseph Spragg Evans, Professor of Medicine, and Dr. Charles Henry Bunting, Professor of Pathology, to mark the close of their many years of service to the Medical School. Dr. Eugene L. Opie, of the Rockefeller Institute for Medical Research, will open the program with a lecture on "Production of Tumors, with Special Reference to Hepatic Tumors

Produced by Feeding Azo-Compounds." Dr. Opie will present another paper entitled "Significant Questions Concerning Transmission and Epidemiology of Tuberculosis" on May 16 at 4:30 P. M.

A dinner honoring Drs. Evans and Bunting will be given on the evening of May 16 by the Faculty of the Medical School. Dr. Bunting was the first Professor of Pathology at the University of Wisconsin Medical School, and is also Chairman of the Deparmtent of Pathology. He came to the university in 1908. Dr. Evans, whose career at the University of Wisconsin began in 1910, is Chairman of the Department of Medicine, and was the Medical School's first Professor of Medicine.

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University of Tennessee
College of Medicine

Dr. K. B. Corbin, Chief of the Division of Anatomy and Head of the Section of Neurology, will be at the Mayo Clinic from April 1 to October 1, 1945. Dr. C. B. Freudenberger, Professor of Anatomy, University of Utah School of Medicine, will be a visiting Professor of anatomy from April 1 to October 1, 1945. Dr. W. Henry Hollinshead, Associate Professor of Anatomy, Duke University School of Medicine, will be a visiting associate professor of anatomy during the summer quarter, 1945.

◆ ◆

Bowman Gray School of Medicine

The lantern slide collection of the late Dr. Chas. H. Cocke, of Asheville, N. C., has been presented to the school. Dr. Harold D. Green, formerly associate professor of physiology at Western Reserve University, has been appointed professor of physiology and pharmacology. Dr. Robert W. Lackey, professor of physiology in Southwestern Medical College, was visiting professor of physiology for the trimester which began March 28th. Bids for the new $250,000 outpatient building were opened March 20th. It is planned to begin construction immediately.

Wayne University
School of Medicine

Dr. Edgar H. Norris has resigned the deanship and the directorship of the Medical Science Center because of ill health. Until his successor is chosen, the affairs of the college have been placed in the charge of an administrative committee consisting of the associate dean, Dr. W. J. Stapleton, Dr. Arthur Smith and Dr. Malcolm Seeley. Dr. Raymond Hussey, recently discharged from the Army, has assumed his duties as dean of the new School of Occupational Health, a part of the Medical Science Center.

◆ ◆

Northwestern University
Medical School

Dr. Derrick Vail, Colonel in the Army Medical Corps and Chief Consultant to the Surgeon General in Ophthalmology, has been appointed Professor of Ophthalmology and Chairman of the Department. He will succeed the late Dr. Sanford R. Gifford. Since 1926 Dr. Vail has been associated with the College of Medicine of the University of Cincinnati. Since 1937 he has been director of the eye department of the Children's Hospital of Cincinnati and also of the Cincinnati General Hospital.

◆ ◆

University of Cincinnati
College of Medicine

Recent gifts include $10,000 to the Christian R. Holmes Hospital from the Holmes Foundation, Inc., $7,500 over three years from the Nutrition Foundation, Inc., for research directed by Dr. Josef Warkany, assistant professor of pediatrics, $17,250 from six contributors for research directed by Dr. Tom D. Spies, associate professor of medicine, and $5,000 from Mrs. David May to the college of medicine May Fund.

◆ ◆

George Washington University
School of Medicine

The old hospital, in use since 1898, will be replaced by a 400 bed structure to be built by the government to meet

the needs of the wartime emergency. The new hospital will be a teaching hospital and will be under the control of the medical school faculty. Mr. Leo G. Smelzer will be superintendent of the new hospital. He will assist Dean Bloedorn, who has been medical director.

◆ ◆

University of Washington

The governor has signed a bill calling for an appropriation of $450,000 for expansion of the premedical school in operation at the University of Washington, Seattle, and $3,750,000 to erect a medical school and hospital as soon as building materials are available. Immediate plans for development of the school contemplate expansion and complete equipment of the existing premedical school to make it a school of the highest quality for teaching the basic medical sciences, which comprise anatomy, physiology, chemistry, bacteriology and pathology. It is planned to begin operation of the school in the fall of 1945, with complete physical preparations and a carefully selected teaching force to meet the demands required. It is planned to start with a freshman class and add other classes as the school progresses.

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Yale University
School of Medicine

Charles-Edward A. Winslow, Dr. P. H., professor of public health and chairman of the department, will conclude 30 years' service when he retires at the end of the current academic year. Colonel Ira V. Hiscock, S.C., A.U.S., professor of public health on leave of absence, will succeed Dr. Winslow as chairman of the department. Colonel Hiscock has been associated with Yale since 1930.

◆ ◆

Southwestern Medical College

The Edward H. Cary lectureship was established recently at the Southwestern Medical College of the Southwestern Medical Foundation, Dallas, as an expression of appreciation to Dr. Edward H. Cary, president of the Southwestern Medical Foundation, for his work in connection with the foundation and the medical school. It is anticipated that three lectures will be presented annually, the first of which has already been given by Dr. Tom D. Spies, associate professor of medicine, University of Cincinnati College of Medicine.

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Stanford University
School of Medicine

Gifts totaling $122,930.18 were received between August 29 and December 14, 1944. They were distributed as follows: Research, $16,822.50; free bed funds, $4,699.08; Postwar Medical Fellowship Fund, $590; loan funds and scholarships, $529; general purpose fund, $100,000; miscellaneous, $289.60.

Dr. T. Henshaw Kelly, associate clinical professor of obstetrics and gynecology, has been appointed acting executive of the department of obstetrics and gynecology.

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Loyola University
School of Medicine

A new medical and dental building to cost approximately $1,500,000 will be erected in the near west side medical center. Plans are ready; construction will begin as soon as it is possible to do so.

Dr. Louis G. Hoffman has been appointed acting chairman of the department of ophthalmology; Dr. Samuel Salinger is acting chairman of the department of otorhinolaryngology.

◆ ◆

University of Southern California
School of Medicine

Honoring thirty-five years of service by the late Dr. Lyle G. McNeile, a chair of obstetrics bearing his name has been founded. Dr. McNeile was a member of the original faculty of the school when it affiliated with the university in 1909. In 1931, he organized the department of obstetrics and gynecology.

University of Rochester
School of Medicine

Dr. Albert D. Kaiser, who was sworn in as health officer of Rochester March 29, has also been given an appointment as professor of child hygiene. Dr. Kaiser, who has been associate professor of pediatrics, was given the full professorship in recognition of his long service to the school and his new position of health officer, in which he succeeded Dr. Arthur M. Johnson.

◆ ◆

West Virginia University
School of Medicine

The state legislature has appropriated $40,000 for the first year and $80,000 for the second year of the biennium to continue the arrangement made several years ago with the Medical College of Virginia to instruct West Virginia students in the junior and senior years of the medical course.

◆ ◆

Medical College of the
State of South Carolina

A full time school of psychology to be connected with the Medical College of the State of South Carolina and a system of traveling psychiatric clinics was recommended for South Carolina by Dr. Victor H. Vogel of the U. S. Public Health Service, consultant in psychology to the National Office of Vocational Rehabilitation.

◆ ◆

Western Reserve University
School of Medicine

The Commonwealth Fund has appropriated $8,200 to be used by Dr. Carl J. Wiggers and associates of the department of physiology for continuance of their studies on the peripheral circulation and shock during 1945-46.

University of Pennsylvania
School of Medicine

Colonel Isidor S. Ravdin, on leave with the U. S. Army, has been appointed John Rhea Barton professor of surgery, succeeding Dr. Eldridge L. Eliason, who will retire from the faculty July 1 but will continue until Colonel Ravdin's return.

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Long Island College of Medicine

The Adam M. Miller Memorial Lecture was delivered by Edmund V. Cowdry, Ph.D., professor of anatomy, Washington University School of Medicine, St. Louis, April 23. Dr. Cowdry spoke on "Microscopic and Chemical Properties of Precancerous Lesions."

◆ ◆

University of California
Medical School

A gift of $2,000 has been received to be known as the Mother Lode Fund, which is to be used in research on epilepsy. The work will be carried out under the direction of Dr. William J. Kerr, professor of medicine.

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University of Oklahoma
School of Medicine

Dr. Basil A. Hayes was recently promoted to professor and chairman of the department of urology and Dr. Ernst Lachmann to professor and chairman of the department of anatomy.

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University of Vermont
College of Medicine

Dr. John F. McIntosh, McGill University Faculty of Medicine, spoke at a meeting of the Osler Society on the "Problem of Urinary Calculi in Ancient Times and in a Modern Clinic."

Book News

Clinical Roentgenology of the Digestive Tract

By Maurice Feldman, M.D., Assistant Professor of Gastroenterology, University of Maryland. Ed. 2. The Williams & Wilkins Company, Baltimore. 1945. Price, $7.

An excellent book for the roentgenologist, gastroenterologist and the internist. Profusely but well illustrated with intelligible reproductions of roentgenograms and diagrams.

◆ ◆

Tropical Medicine

By Sir Leonard Rogers and Sir John W. D. Megaw, London School of Tropical Medicine. Ed. 5. The Williams & Wilkins Company, Baltimore. 1945.

◆ ◆

Medical Gynecology

By James C. Janney, M.D., Assistant Professor of Gynecology, Boston University School of Medicine. W. B. Saunders Company, Philadelphia. 1945. Price, $5.

Objective: To aid the medical students to correlate didactic lectures with experience gained in the gynecologic clinic. The author has succeeded well. The book is based on his long experience as a teacher.

◆ ◆

Peripheral Nerve Injuries: Principles of Diagnosis

By Webb Haymaker, Neuropathologist, Army Institute of Pathology, and Barnes Woodhall, Chief, Neurological Section, Walter Reed Hospital. W. B. Saunders Company, Philadelphia. 1945. Price, $4.50.

For medical officers but also of value to medical students. Divided into three sections: I. The principles of innervation; II. Examination of the patient; III. Clinical features of plexus and peripheral nerve injuries.

◆ ◆

A Manual of Tropical Medicine

Prepared under the auspices of the Division of Medical Sciences of the National Research Council. Colonel Thomas T. Mackie; Major George W. Hunter, III; Captain C. Brooke Worth. W. B. Saunders Company, Philadelphia. 1945. Price, $6.

One of a series of books furnished the medical departments of the Army and the Navy giving necessary information in the field of military medicine.

Constitution and Disease: Applied Constitutional Pathology

By Julius Bauer, M.D., Professor of Clinical Medicine, College of Medical Evangelists. Ed. 2. Grune & Stratton, New York. 1945. Price, $4.

An admirable survey of constitutional determinants in familial and racial diseases. Emphasis is placed on diagnosis and treatment of the individual rather than on the clinical entity. A good book for the thinking physician.

◆ ◆

Trauma in Internal Diseases: With Consideration of Experimental Pathology and Mediocolegal Aspects

By Rudolf A. Stern, M.D., Assistant Attending Physician, City Hospital, New York. Foreword by Francis Carter Wood, M.D., Director of Laboratories and Radiotherapy Department, St. Luke's Hospital, New York. Grune & Stratton, New York. 1945. Price, $6.75.

An interesting book. Industrial physicians and medicolegal experts will find it valuable in their work. The book is replete with illustrative case reports.

◆ ◆

Doctors at War

Edited by Morris Fishbein, M.D., Chairman of the Committee on Information of the Division of Medical Sciences of the National Research Council. E. P. Dutton & Company, New York. 1945. Price, $5.

Written for the layman as well as the doctor, this book occupies a unique place in the medical documentation of the war. Sixteen leading authorities responsible for organizing our medical warfare give stirring accounts of what each branch has accomplished. It is a momentous story of what doctors and medical research have done and are doing to save thousands of lives on all battle fronts and to safeguard the health of those at home.

◆ ◆

Pye's Surgical Handicraft

Edited by Hamilton Bailey, F.R.C.S., Eng. Surgeon Royal Northern Hospital, London. Ed. 14. The Williams & Wilkins Company, Baltimore. 1945. Price, $6.50.

A manual of surgical manipulations, minor surgery and other matters connected with the work of surgical dressers, house surgeons and practitioners. Fully revised.

Textbook of Abnormal Psychology

By Roy M. Dorcas, Associate Professor of Psychology, University of California at Los Angeles, and G. Wilson Shaffer, Lecturer in Psychology, Johns Hopkins University. Ed. 3. The Williams & Wilkins Company, Baltimore. 1945. Price, $4.

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Textbook of Anaesthetics

By R. J. Minnitt, M.D., Lecturer in Anaesthesia, University of Liverpool, and John Gillies, M.C., M.B., Consultant in Anaesthetics, Department of Health of Scotland. Ed. 6. The Williams & Wilkins Company, Baltimore. 1945. Price, $7.

An excellent book; gives full coverage of the subject.

◆ ◆

Anatomy and Physiology for Students of Physiotherapy, Occupational Therapy and Gymnastics

By C. F. V. Smout, M.D., Acting Professor of Anatomy, University of Birmingham, and R. J. S. McDowall, M.D., Professor of Physiology, University of London. The Williams & Wilkins Company, Baltimore. 1945. Price, $8.

Radiologic Examination of the Small Intestine

By Ross Golden, M.D., Professor of Radiology, Columbia University College of Physicians and Surgeons. J. B. Lippincott Company, Philadelphia. 1945. Price, $6.

An outstanding contribution to literature in the field of radiologic examination, with 183 subjects in 75 figures. Of particular interest are the newer ideas concerning the transmission of nerve impulses, sometimes called the "chemical mediator" theory. Of importance to the surgeon, the internist and the radiologist.

◆ ◆

Penicillin Therapy: Including Tyrothricin and Other Antibiotic Therapy

By John A. Kolmer, M.D., Professor of Medicine, Temple University. D. Appleton-Century Company, New York. 1945. Price, $5.00.

Penicillin therapy is discussed as of today. Various methods of administration are described; the author speaks of his own experience as well as that of other clinicians. A separate section is devoted to the properties and clinical applications of tyrothricin, gramacidin, gramacicin S; streptothricin, streptomycin, patulin and chlorophyll. The literature is covered by numerous references.

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